International Labour Organization

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Skills demand and supply assessment in the Chattogram–Cox's Bazar region, Bangladesh

© International Labour Organization 2024

First published 2024

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ISBN: 9789220406311 (print)
ISBN: 9789220404850 (web PDF)

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Printed in Bangladesh

Skills demand and supply assessment in the Chattogram–Cox's Bazar region, Bangladesh

May – December 2023

▶ Contents

▶ Figures and tables 04

▶ List of acronyms 13

▶ Executive summary 14

▶ Chapter 1. Introduction 21

1.1. Regional economic landscape 21

1.2. Rationale of the study 22

1.3. Objective of the study 22

1.4. Geographical and economic sector scope 22

1.5. Methodology 23

1.6. Limitations of the study 26

1.7. TVET and the skills ecosystem of Bangladesh 26

1.8. Systematic constraints analysis 27

1.9. Anticipated impact of the regional skills needs and supply assessments 32

▶ Chapter 2. Construction sector 35

2.1. Profile and situation analysis for the construction sector 35

2.2. Profile of major occupations 39

2.3. Current workforce and skills 43

2.4. Workforce development 46

2.5. Future labour and skills demand 49

2.6. Vision for the future of the sector 52

2.7. Gaps in the capabilities and skills needed to achieve the vision for the future 53

2.8. Skills supply findings 56

2.9. Skills gap analysis 72

2.10. Recommendations 74

▶ Chapter 3. Tourism and hospitality sector 77

3.1. Introduction 77

▶ Contents

3.2. Profile and situation analysis for the tourism and hospitality sector 77
3.3. Profile of major occupations 82
3.4. Current workforce and skills 86
3.5. Workforce development 89
3.6. Future labour and skills demand 92
3.7. Vision for the future of the sector 94
3.8. Gaps in the capabilities and skills needed to achieve the vision for the future 95
3.9. Skills implications for key business capability gaps 97
3.10. Skills supply findings 98
3.11. Sector-specific key supply side systemic constraints and challenges 116
3.12. Skills gap analysis 118
3.13. Recommendations 119

▶ Chapter 4. Transport sector 123
4.1. Introduction 123
4.2. Profile and situation analysis for the transport sector 124
4.3. Profile of major occupations 129
4.4. Current workforce and skills 132
4.5. Workforce development 136
4.6. Future labour and skills demand 139
4.7. Vision for the future of the sector 141
4.8. Gaps in the capabilities and skills needed to achieve the vision for the future 142
4.9. Skills supply findings 145
4.10. Sector-specific key supply side systemic constraints and challenges 160
4.11. Skills gap analysis 161
4.12. Recommendations 162

▶ Chapter 5. Manufacturing sector 165
5.1. Introduction 165
5.2. Profile and situation analysis for the manufacturing sector 165

▶ Contents

5.3. Profile of major occupations 173
5.4. Current workforce and skills 177
5.5. Workforce development 179
5.6. Future labour and skills demand 182
5.7. Vision for the future of the sector 184
5.8. Gaps in the capabilities and skills needed to achieve the vision for the future 185
5.9. Skills supply findings 188
5.10. Sector-specific key supply side systemic constraints and challenges 205
5.11. Skills gap analysis 206
5.12. Recommendations 208

▶ Chapter 6. Agri-food processing sector 211
6.1. Introduction 211
6.2. Profile and situation analysis for the agri-food sector 211
6.3. Profile of major occupations 217
6.4. Vision for the future of the sector 222
6.5. Gaps in the capabilities and skills needed to achieve the vision for the future 223
6.6. Skills supply findings 225
6.7. Sector-specific key supply side systemic constraints and challenges 240
6.8. Skills gap analysis 240
6.9. Recommendations 242

▶ References 245
▶ Annexes 251
Annex 1. Skills demand assessment methodology 251
Annex 2. Institutional mapping of the five priority sectors 253
Annex 3. Major occupations in the five priority sectors 262
Annex 4. Skills supply assessment methodology 272
Annex 5. List of key informants 273
Annex 6. Overview of focus group discussions 275

▶ List of figures

Figure 1. Overview and timeline of the skills demand and supply assessment in the Chattogram–Cox's Bazar region 24

Figure 2. Overview of surveyed construction sector enterprises: Length of business operation, legal status and size of enterprise (no. of respondents, N=14) 36

Figure 3. Value chain of the construction sector 37

Figure 4. Major occupations in the construction sector according to surveyed enterprises (no. of respondents, N=14) 41

Figure 5. Vacant positions in surveyed construction enterprises (no. of respondents, N=14) 42

Figure 6. Hard-to-fill occupations in the construction sector according to surveyed enterprises (no. of respondents, N=14) 43

Figure 7. Skills gaps cited by construction enterprises (no. of respondents, N=14) 44

Figure 8. Number of workers in surveyed enterprises with qualifications surpassing their job requirements (no. of respondents, N=14) 44

Figure 9. Preparedness level of new entrants in their first jobs, by type of new entrant (no. of respondents, N=14) 45

Figure 10. Measures taken by enterprises to overcome challenges related to workers not being fully proficient (no. of respondents, N=14) 46

Figure 11. Enterprises' support for job training in the last 12 months (no. of respondents, N=14) 47

Figure 12. Construction enterprises' reasons for not providing/funding education or training (no. of respondents, N=14) 48

Figure 13. Types of training arranged by construction enterprises (no. of respondents, N=14) 49

Figure 14. Occupations that will be in demand in the future, according to construction enterprises (no. of respondents, N=14) 50

Figure 15. Skills that construction sector enterprises consider important when recruiting workers (no. of respondents, N=14) 51

Figure 16. Skills that will be in demand in the future, according to construction enterprises (no. of respondents, N=14) 52

Figure 17. Prevalence of construction-related courses in surveyed TVET providers, by owner/operator of the provider 59

Figure 18. Prevalence of construction-related courses in different types of TVET providers (%) 60

Figure 19. Level of the construction-related skills programmes available (%) 60

Figure 20. Ratio of male and female trainees enrolled in construction-related programmes in the Chattogram region, by training programme level (%) 61

Figure 21. Ratio of male and female trainees enrolled in construction-related programmes in Cox's Bazar, by training programme level (%) 62

▶ List of figures

Figure 22. Enrolment and graduation numbers for construction-related programmes in Cox's Bazar, 2019–22 63

Figure 23. Enrolment and graduation numbers for construction-related programmes in the Chattogram region, 2019–22 63

Figure 24. Adequacy of training equipment in construction-related training programmes, by type of TVET provider (%) 64

Figure 25. Digitization status of TVET providers in regard to construction sector-related programmes (%) 65

Figure 26. Facilities available in TVET providers offering construction sector-related programmes (%) 66

Figure 27. Status of construction-related RPL offerings in TVET providers, by type of provider (%) 67

Figure 28. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on construction-related programmes (%) 67

Figure 29. Share of TVET providers offering construction-related programmes that have placement cells for graduates (%) 68

Figure 30. Course delivery method for construction sector-related TVET programmes, by owner/operator of the TVET provider (%) 69

Figure 31. Support services available at TVET providers offering construction-related programmes (%) 70

Figure 32. Availability of apprenticeship opportunities linked to construction-related TVET programmes (%) 71

Figure 33. Overview of surveyed tourism and hospitality sector enterprises: Length of business operation, legal status and size of enterprise (no. of respondents, N= 126) 78

Figure 34. Value chain of the tourism and hospitality sector 79

Figure 35. Major occupations in the tourism and hospitality sector according to surveyed enterprises (% of respondents, N=126) 84

Figure 36. Vacant positions in surveyed tourism enterprises (% of respondents, N=126) 85

Figure 37. Hard-to-fill occupations in the tourism and hospitality sector according to surveyed enterprises (% of respondents, N=126) 86

Figure 38. Skills gaps cited by tourism enterprises (% of respondents, N=126) 87

Figure 39. Main causes of workers not being fully proficient, according to tourism enterprises (% of respondents, N=126) 88

Figure 40. Number of workers in surveyed enterprises with qualifications surpassing their job requirements (% of respondents, N=126) 88

Figure 41. Preparedness level of new entrants in their first jobs, by type of new entrant (% of respondents, N=126) 89

▶ List of figures

Figure 42. Measures taken by the enterprises to overcome of challenges related to workers not being fully proficient (% of respondents, N=126) 90

Figure 43. Enterprises' support for job training in last 12 months (% of respondents, N=126) 90

Figure 44. Tourism enterprises' reasons for not providing/funding education or training (% of respondents, N=126) 91

Figure 45. Types of training arranged by tourism enterprises (% of respondents, N=126) 92

Figure 46. Occupations that will be in demand in the future, according to tourism enterprises (% of respondents, N=126) 93

Figure 47. Skills that will be in demand in the future, according to tourism and hospitality enterprises (% of respondents, N=126) 94

Figure 48. Vision of tourism's future in Bangladesh 95

Figure 49. Prevalence of tourism-related courses in surveyed TVET providers, by owner/operator of the provider 101

Figure 50. Prevalence of tourism-related courses in different types of TVET providers 102

Figure 51. Level of the tourism and hospitality-related skills programme available (%) 102

Figure 52. Ratio of male and female trainees enrolled in tourism-related courses (%) 103

Figure 53. Enrolment and graduation numbers for tourism related programmes in Chattogram, 2019–22 104

Figure 54. Enrolment and graduation numbers for tourism and hospitality-related programmes in Cox's Bazar, 2019–22 105

Figure 55. Adequacy of training equipment in tourism and hospitality-related training programmes, by owner/operator of the provider (%) 105

Figure 56. Digitization status of TVET providers in regard to tourism and hospitality sector-related programmes (%) 106

Figure 57. Facilities available in TVET providers offering tourism and hospitality sector-related programmes (%) 107

Figure 58. Status of tourism and hospitality-related RPL offerings in TVET providers, by type of provider (%) 108

Figure 59. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on tourism and hospitality-related programmes (%) 109

Figure 60. Share of TVET providers offering tourism and hospitality-related programmes that have placement cells for graduates (%) 110

Figure 61. Course delivery method for tourism and hospitality sector-related TVET programmes, by owner/operator of the TVET provider 111

Figure 62. Source of tuition fees for tourism and hospitality-related TVET programmes (%) 112

Figure 63. Support services provided available at TVET providers offering tourism and hospitality-related programmes (%) 113

▶ List of figures

Figure 64. Availability of apprenticeship opportunities linked to tourism and hospitality-related TVET programmes (%) 114

Figure 65. Overview of surveyed transport sector enterprises: Length of business operation, legal status and size of enterprises (% of respondents, N=75) 125

Figure 66. Generic sector value chain for the transport sector 126

Figure 67. Major occupations in the transport sector according to surveyed enterprises (% of respondents, N=75) 130

Figure 68. Vacant positions in surveyed transport enterprises (% of respondents, N=75) 131

Figure 69. Hard-to-fill occupations in the transport sector according to surveyed enterprises (% of respondents, N=75) 132

Figure 70. Skills gaps cited by transport enterprises (% of respondents, N=75) 133

Figure 71. Main causes of workers not being fully proficient, according to transport enterprises (% of respondents, N=75) 134

Figure 72. Share of workers in surveyed enterprises with qualifications surpassing their job requirements (% of respondents, n=75) 134

Figure 73. Preparedness level of new entrants in their first jobs, by type of new entrant (% of respondents, N=75) 135

Figure 74. Measures taken by enterprises to overcome challenges related to workers not being fully proficient (% of respondents, N=75) 136

Figure 75. Enterprises' support for job training in last 12 months (% of respondents, N=75) 137

Figure 76. Transportation enterprises' reasons for not providing/funding education or training (% of respondents, N=75) 138

Figure 77. Types of training arranged by transportation enterprises (no. of respondents, N=75) 138

Figure 78. Occupations that will be in demand in the future, according to transport enterprises (% of respondents, N=75) 139

Figure 79. Skills that will be in demand in the future, according to transport enterprises (% of respondents, N=75) 140

Figure 80. Categories of skills that will be in demand in the next 2–3 years (% of respondents, N=75) 141

Figure 81. Prevalence of transport-related courses in surveyed TVET providers, by owner/operator of the provider (%) 147

Figure 82. Prevalence of transport-related courses in different types of TVET providers 148

Figure 83. Level of the transport-related skills programme available (%) 148

Figure 84. Ratio of male and female trainees enrolled status in transport-related programmes, by training programme level 149

Figure 85. Enrolment and graduation numbers for transport-related programmes in Cox's Bazar, 2019–22 150

▶ List of figures

Figure 86. Enrolment and graduation numbers for transport-related programmes in the Chattogram region, 2019–22 150

Figure 87. Adequacy of training equipment in transport-related training programmes, by type of TVET provider (%) 151

Figure 88. Digitization status of TVET providers in regard to transport sector-related programmes (%) 152

Figure 89. Facilities available in TVET providers offering transport sector-related programmes (%) 153

Figure 90. Status of transport-related RPL offerings in TVET providers, by type of provider (%) 154

Figure 91. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on transport-related programmes (%) 154

Figure 92. Course delivery method for transport sector-related TVET programmes, by owner/operator of the TVET provider (%) 155

Figure 93. Source of tuition fees for transport-related TVET programmes (%) 156

Figure 94. Pre-training support services offered by TVET providers with transport-related programmes (%) 156

Figure 95. During training support services offered by TVET providers with transport-related programmes (%) 157

Figure 96. Post-training support services offered by TVET providers with transport-related programmes (%) 157

Figure 97. Availability of apprenticeship opportunities linked to transport-related TVET programmes (%) 158

Figure 98. Share of all workers in the Chattogram–Cox's Bazar region working in the manufacturing sector, by district and sex (%) 166

Figure 99. Overview of surveyed manufacturing sector enterprises: Length of business operations, legal status and size of enterprise (% of respondents, N=217) 167

Figure 100. Value chain for the manufacturing sector 167

Figure 101. Major occupations in the manufacturing sector according to surveyed enterprises (% of respondents, N=217) 175

Figure 102. Vacant positions in surveyed manufacturing enterprises (% of respondents, N=217) 175

Figure 103. Hard-to-fill occupations in the manufacturing sector according to surveyed enterprises (% of respondents, N=217) 176

Figure 104. Skills gaps cited by manufacturing enterprises (% of respondents, N=217) 177

Figure 105. Main causes of workers not being fully proficient, according to manufacturing enterprises (% of respondents, N=217) 178

Figure 106. Share of workers in surveyed enterprises with qualifications surpassing their job requirements (% of respondents, N=217) 178

▶ List of figures

Figure 107. Preparedness level of new entrants in their first jobs, type of new entrant (% of respondents, N=217) 179

Figure 108. Measures taken by enterprises to overcome challenges related to workers not being fully proficient (% of respondents, N=217) 180

Figure 109. Enterprises' support for job training in last 12 months (% of respondents, N=217) 180

Figure 110. Manufacturing enterprises' reasons for not providing/funding education or training (% of respondents, N=217) 181

Figure 111. Types of training arranged by manufacturing enterprises (% of respondents, N=217) 182

Figure 112. Occupations that will be in demand in the future, according to manufacturing enterprises (% of respondents, N=217) 183

Figure 113. Skills that will be in demand in the future, according to manufacturing enterprises (% of enterprises, N=217) 184

Figure 114. Prevalence of manufacturing-related courses in surveyed TVET providers, by owner/operator of the provider (%) 190

Figure 115. Prevalence of manufacturing-related courses in different type of providers 191

Figure 116. Level of the manufacturing-related skill programmes available 191

Figure 117. Ratio of male and female trainees enrolled in manufacturing-related programmes, by training programme level (%) 193

Figure 118. Enrolment and graduation numbers for manufacturing-related programmes in the Chattogram region, 2019–22 194

Figure 119. Enrolment and graduation numbers for manufacturing-related programmes in Cox's Bazar, 2019–22 194

Figure 120. Adequacy of training equipment in manufacturing-related training programmes, by type of TVET provider (%) 195

Figure 121. Digitization status of TVET providers in regard to manufacturing sector-related programmes (%) 196

Figure 122. Facilities available in TVET providers offering manufacturing sector-related programmes (%) 197

Figure 123. Status of manufacturing-related RPL offerings in TVET providers, by type of provider (%) 198

Figure 124. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on manufacturing-related programmes (%) 199

Figure 125. Share of TVET providers offering manufacturing-related programmes that have placement cells for graduates (%) 199

Figure 126. Course delivery method for manufacturing sector-related TVET programmes, by owner/operator of the TVET provider (%) 200

▶ List of figures

Figure 127. Source of tuition fees for manufacturing-related TVET programmes (%) 201

Figure 128. Support services available at TVET providers offering manufacturing-related programes 202

Figure 129. Availability of apprenticeship opportunities linked to manufacturing-related TVET programmes (%) 203

Figure 130. Sectoral growth in Agri-food subsector 212

Figure 131. Value chain for Agri-food processing sector 214

Figure 132. Prevalence of agri-food-related courses in surveyed TVET providers, by owner/operator of the provider (%) 227

Figure 133. Prevalence of agri-food-related courses in different types of TVET providers 227

Figure 134. Level of agri-food-related skills programmes available (%) 228

Figure 135. Ratio of male and female trainees enrolled in agri-food-related programmes, by training programme level (%) 229

Figure 136. Enrolment and graduation numbers for agri-food-related programmes in Cox's Bazar, 2019–22 230

Figure 137. Enrolment and graduation numbers for agri-food-related programmes in the Chattogram region, 2019–22 230

Figure 138. Adequacy of training equipment in agri-food-related training programmes, by type of TVET provider (%) 231

Figure 139. Digitization status of TVET providers in regard to agri-food sector-related programmes (%) 232

Figure 140. Facilities available in TVET providers offering agri-food sector-related programmes (%) 233

Figure 141. Status of agri-food-related RPL offerings in TVET providers, by type of provider (%) 233

Figure 142. Status of collaboration of TVET providers with CBOs, NGOs and social organizations on agri-food-related programmes (%) 234

Figure 143. Share of TVET providers offering agri-food-related programmes that have placement cells for graduates (%) 235

Figure 144. Course delivery method for agri-food sector-related TVET programmes, by owner/operator of the TVET provider (%) 236

Figure 145. Sources of tuition fees for agri-food-related TVET programmes (%) 236

Figure 146. Support services available at TVET providers offering agri-food-related programmes (%) 237

Figure 147. Availability of apprenticeship opportunities linked to agri-food-related TVET programmes (%) 238

▶ List of tables

Table 1. Overview of the geographic distribution of survey respondents for the skills demand assessment by district 25

Table 2. Overview of the geographic distribution of survey respondents for the skills supply assessment, by district 25

Table 3. Dropout rates by education level and sex, 2020–22 (%) 31

Table 4. Major occupations in the construction sector 40

Table 5. Skills needed to address major business capability gaps in the construction sector 54

Table 6. Available construction sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level 57

Table 7. Typical career pathways in the construction sector, by TVET programme certification level 58

Table 8. Presence of internal factors affecting the sustainability of TVET providers offering construction-related course 71

Table 9. Training gap analysis for priority occupations in the construction sector 73

Table 10. Major occupations in the tourism and hospitality sector 82

Table 11. Skills needed to address major business capability gaps in the tourism and hospitality sector 97

Table 12. Available tourism and hospitality sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level 98

Table 13. Typical career pathways in the tourism and hospitality sector, by TVET programme certification level 99

Table 14. Number of surveyed TVET providers offering tourism and hospitality-related courses, by owner/operator of the TVET provider 100

Table 15. Presence of internal factors affecting the sustainability of TVET providers offering tourism-related courses 115

Table 16. Training gap analysis for priority occupations in the tourism and hospitality sector 118

Table 17. Transportation mega projects in the Chattogram–Cox's Bazar region 123

Table 18. Skills needed to address major business capability gaps in the transport sector 144

Table 19. Available transport sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level 145

Table 20. Share of surveyed TVET providers offering transport-related courses 146

Table 21. Presence of internal factors affecting the sustainability of TVET providers offering transport-related courses 159

Table 22. Training gap analysis for priority occupations in the transport sector 161

Table 23. Major occupations in manufacturing sector 173

▶ List of tables

Table 24. Skills needed to address major business capability gaps in the manufacturing sector 187

Table 25. Available manufacturing sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level 188

Table 26. Share of surveyed TVET providers offering manufacturing-related courses, by owner/operator of the provider 189

Table 27. Presence of internal factors affecting the sustainability of TVET providers offering manufacturing-related courses 204

Table 28. Training gap analysis for priority occupations in the manufacturing sector 207

Table 29. Available agri-food sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level 225

Table 30. Share of surveyed TVET providers offering agri-food-related courses 226

Table 31. Presence of internal factors affecting the sustainability of TVET providers offering agri-food-related courses 239

Table 32. Training gap analysis for priority occupations in the agri-food sector 241

▶ List of acronyms

ADB	Asian Development Bank
BMET	Bureau of Manpower, Employment and Training
BSTI	Bangladesh Standards and Testing Institution
BTEB	Bangladesh Technical Education Board
CAD	Computer Aided Design
CBO	community-based organization
EPZ	Export Processing Zone
ESS	Establishment Skills Survey
FGD	focus group discussion
GDP	gross domestic product
HR	human resources
HSC	Higher Secondary Certificate
ICT	information and communication technology
ISC	Industry Skills Council
KII	key informant interview
MFS	mobile financial service
NEET	not in education, employment or training
NGO	non-governmental organization
NSC	National Skill Certificate
NSDA	National Skills Development Authority
NTVQF	National Technical and Vocational Qualifications Framework
RPL	Recognition of Prior Learning
SDG	Sustainable Development Goal
SMEs	small and medium enterprises
SSC	Secondary School Certificate
STED	Skills for Trade and Economic Diversification
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TSC	Technical School and College
TTC	Technical Training Center
TVET	Technical and Vocational Education and Training
Voc	Vocational

▶ Executive summary

Background

The ILO is executing the "Leaving No One Behind: Improving Skills and Economic Opportunities for the Women and Youth in Cox's Bazar, Bangladesh" initiative, funded by Global Affairs Canada. As part of this initiative, a two-faceted assessment has been conducted that includes industry skills demand anticipation and skills supply side assessment. The study aims to undertake a regional skills supply, demand and needs assessment in the Chattogram–Cox's Bazar region, focusing on five priority economic sectors. In this study, Chattogram–Cox's Bazar region is defined as including the districts of Chattogram, Khagrachari, Bandarban, Rangamati and Cox's Bazar.

Rationale

Chattogram, a pivotal city in Bangladesh, stands as a major industrial and economic hub, hosting approximately 40 per cent of the nation's heavy industry and serving as a significant centre for the ready-made garment sector. In 2010, it boasted the lowest poverty rate among major Bangladeshi cities, attributing this feat to its high employment rate. The city's vibrant economy, particularly dominated by industrial firms and the apparel industry, offers abundant job opportunities, reflected in its substantial industrial output, international trade, and contribution to government revenue.

By contrast, Cox's Bazar district, with a population of 3.2 million, faces challenges such as poor land quality and frequent natural disasters, contributing to a higher poverty rate. Despite these challenges, the district holds potential in its tourism and hospitality sector for future employment opportunities and anticipates growth in the construction industry. As of 2018, Cox's Bazar contributed 2.1 per cent to the national GDP from agriculture, 1.2 per cent from industry, and 1.2 per cent from services, indicating developmental potential in these sectors.

Similarly, the districts of Bandarban, Rangamati, and Khagrachari – collectively known as the Chattogram Hill Tracts – are gaining economic significance despite their current challenges. These areas, marked by high poverty rates, are undergoing developmental initiatives, including the construction of a 317-kilometer border road to enhance connectivity and stimulate the economy. Additionally, a focus on ecotourism and community-based tourism aligned with local laws and regulations, aims to generate revenue and elevate the contribution of these districts to the national economy. With these plans and ongoing developments, substantial growth in GDP and employment opportunities is anticipated in the Chattogram Hill Tracts, reflecting a broader trend of economic dynamism in Bangladesh, as well as economic growth, ensuring employability, and addressing the unique demands of the Chattogram–Cox's Bazar region.

Given the economic importance of these sectors, the study becomes crucial for anticipating and addressing skills needs and supply. This study, through skill demand and supply assessments, is poised to provide strategic recommendations for fostering economic growth, ensuring employability, and addressing the unique demands of the Chattogram–Cox's Bazar region.

Methodology

The skills need and supply assessments conducted for this study applied the ILO's Skills for Trade and Economic Diversification (STED) methodology. This assessments applied a mixed methodology, incorporating surveys with 432 industries and 202 technical and vocational education and training (TVET) providers in the region, as well as focus group discussions with workers and trainees/graduates and key informant interviews with industry associations and government authorities. The outcomes of the study were presented to stakeholders during a STED Foresight Workshop, not only to be validated but also to engage them in the process of strategic analysis, visioning, and the development of conclusions and recommendations.

Findings and recommendations

▶ Construction sector

The construction sector in Chattogram faces skill gaps, notably in masonry, tile fitting, and specific technical roles such as heavy equipment operation. Mason roles are challenging to fill due to the demanding nature of the job and a need for experienced individuals with good health. Critical occupations such as Supervisors, Tile Fitters, and Plumbers are expected to be in high demand. The sector's growth aligns with national goals, necessitating a focus on domestic and international markets. Training programmes vary, with diploma graduates often starting as foremen, while Secondary School Certificate (SSC) and National Skill Certificate (NSC) graduates enter industry roles at the bottom of the career ladder. Collaboration, digitization and facilities adequacy are areas needing improvement.

To address skill gaps in the construction sector, key recommendations include enhancing certified trainer numbers, especially female trainers for courses such as computer-assisted design (CAD) and interior design. There is a need to introduce TVET courses aligned with national and international demands – such as for Masons, Tile Fitters, Painters, Foundation Workers, Demolition Workers, Heavy Equipment Operators, Glaziers, Aluminum Fabricators, and Geotechnical Engineers and Technicians. Other recommendations focus on:

- promoting desk-based work and freelancing for women;
- expanding course offerings with advanced modules;
- facilitating TVET provider affiliations;
- regularly realigning course curricula to meet industry needs;
- validation informal/non-formal learning through Recognition of Prior Learning (RPL);
- strengthening core skills, digital literacy, and safety awareness;
- fostering industry–TVET provider collaboration and industry involvement with training delivery and job fairs;
- ensuring inclusive infrastructure and sustainable practices;
- advocating for improved bilateral agreements; and
- implementing Labour Market Information Systems (LMISs) for strategic planning.

▶ Tourism and hospitality sector

Bangladesh aims to attract 5.57 million foreign tourists annually by 2041, creating 21.94 million jobs. Key projects include upgrading the Cox's Bazar airport to allow for international flights and the Dhaka–Cox's Bazar Railway. Stakeholders envision sustainable tourism growth, emphasizing skilled labour, technology integration, and environmental preservation. They seek government support for a cohesive regional tourism policy and a dedicated authority to ensure tourism brings

a positive experience for visitors and economic sustainability within the sector. Critical skills for the tourism and hospitality sector include digital marketing, innovative marketing, customer service, branding, compliance training, guest handling, communication, environmental management, eco-tourism, waste management, renewable energy, business development, safety (fire incident and first aid), problem-solving, tourist behaviour analysis, technology usage (website and mobile app), and human resource management (planning, recruitment, career counseling).

With the sector, there is a need for skills upgrades among key personnel in the accommodation and catering subsector, such as Hotel/Guesthouse Managers and Hotel Supplies Providers, to meet international standards. Housekeeping and Front Office Management are also high priority roles that need improvements in relation to organizational and problem-solving skills. The sector also closely involves transportation in its value chain, which includes local drivers (taxis, buses, tuk-tuks) and rickshaw pullers, with these occupations requiring enhanced skills in communication and safety. The entertainment subsector need upgraded kills in performance and organization; while sports tourism, which includes niche roles such as surfing trainers and parasailing operators, demonstrates steady demand but is not critically urgent.

To enhance skills in the tourism and hospitality sector in Chattogram and Cox's Bazar, collaboration with the Bangladesh Technical Education Board (BTEB) is crucial. The focus should be on expanding formal courses, introducing diverse entertainment experiences, and leveraging existing facilities, such as top-rated hotels, for industry-driven skills development. Essential soft skills, online marketing, and interpersonal skills should be integrated into tourism and hospitality-related curricula. Encouraging collaborations between employers and TVET providers (including industry involvement in training delivery), emphasizing social inclusivity, implementing RPL programmes, and advocating for regional policies can address systemic challenges, ensuring a skilled, inclusive and sustainable tourism and hospitality workforce in the region.

▶ Transport sector

Key occupations within the transport sector include Welders, HVAC Technicians, Technicians for Electrical and Navigational Equipment, Auto Electricity Servicing Technicians, and Air Duct Service Technicians. These roles demand specialized technical knowledge and skills. Supply side findings revealed the crucial trades need to be introduced widely, such as body/coach building, electric automobile repair, motor mechanization, and software-based diagnosis technician.

To enhance automotive technicians' skills, training programmes should incorporate the latest diagnostic tools, focus on automotive electronics, and prioritize safety protocols. Core work skills, including communication and customer service, are crucial. Collaboration between employers and training providers is essential, and there is a need to emphasize on-the-job training through structured apprenticeships and industry engagement. Regular curriculum reviews with the aim of aligning learning with industry expectations, integration of industry certifications, and upgrading technological infrastructure in training providers are all needed to align TVET programmes with dynamic industry needs, thereby enhancing graduates' employability.

▶ Manufacturing sector

The manufacturing sector includes essential management and supervisory roles as well as technical and engineering roles, wherein Managers, Supervisors, and Mechanical and Electrical Technicians are crucial. For operational and production roles, Machine Operators and Technicians are highly in demand. The creative and design roles within the industry, which include occupations such as Designers, tend to be niche occupations, but are essential for product aesthetics and functionality. In addition, sales, marketing and finance roles require occupations such as Sales Executives and Accountants.

Machine Operators appear to be the most in-demand role and the most difficult to recruit, indicating a significant shortage of certified operators. Managers and Sales Executives are also highly in demand at present and expected to be among the most in-demand roles in the future, signaling a strategic emphasis on leadership and business development. Technical roles – such as the aforementioned Machine Operators – are also viewed as crucial, indicating the sector's need for operational efficiency.

In the context of skills supply, TVET providers offering manufacturing-related courses face challenges related to curriculum relevance, delivery methods, and industry linkages. The curriculum is perceived as lagging behind industry demands, necessitating realignment. Teaching methods and trainer preparation are identified as areas needing improvement. Apprenticeship opportunities are limited, hindering practical learning. Furthermore, the lack of formal connections between TVET providers and the manufacturing industry impedes work-based learning and employment prospects for graduates. The study underscores the importance of collaborative efforts between stakeholders to address these challenges and to enhance the quality and relevance of TVET programmes.

The proposed strategies aim to enhance:

- occupational skills such as machine operation (including CNC machine), packaging (both primary and secondary), quality control, and assembling;
- core work skills (that is, "soft skills");
- collaboration between employers and training providers; and
- access to skills development and lifelong learning.

The study recommends initiatives that include comprehensive training-of-trainers programmes, advocacy for advanced-level courses, partnerships with enterprises, and specific training in CNC machine operation.

▶ Agri-food sector

Priority occupations in the agri-food sector include bakers, food processors, quality controllers, food safety specialists, refrigeration operators, and various specialists in poultry, meat and grain processing. These occupations require a blend of technical skills, occupation safety and health knowledge, and specialized expertise in specific food processing areas.

The agri-food sector in the Chattogram–Cox's Bazar region faces significant challenges in skills training and workforce development. The available skills programmes, especially at the diploma and certificate levels, are limited, with a notable absence of courses in critical areas such as Food Safety and Hygiene Management and Dairy Processing. The TVET landscape shows a low prevalence of agri-food-related courses, particularly in Cox's Bazar. Challenges include inadequate curriculum relevance, outdated delivery practices, and a lack of formal apprenticeship opportunities. The sector needs concerted efforts to address these systemic constraints and to bridge the existing skill gaps.

To address specific occupational skills in agri-food sector, training programmes in Food Safety and Hygiene Management, Meat and Poultry Processing, Dairy Processing, Food Processing and Preservation, Food Processing, Packaging, Poultry Rearing, and Livestock Rearing should be expanded, given Chattogram's role as an agri-food hub. Entrepreneurship-focused programmes on food processing (such as pickling, seaweed-based product manufacturing) can empower individuals. Core work skills that include team management and business management training are recommended for entrepreneurship development. Collaboration opportunities through industry–academia partnerships and joint training programmes could enhance the alignment of skills development initiatives with industry needs. RPL certification opportunities will foster inclusivity, recognizing and certifying non-formal expertise. Advocating for industry-affiliated training programmes and work-based learning in the industry can further enrich training programmes, ensuring they are demand-driven and aligned with industry requirements.

Priority occupations in the five target sectors

Construction	Tourism and hospitality	Transport	Manufacturing	Agri-food
Mason	Front Office Executive	Body/Coach Building Technician	Machine Operator	Food Safety and Hygiene Technician
Tile Fitter	Tour Guide	Driver	Mechanical/ Repairing Technician	Baker
Plumber	Housekeeping	Motor Mechanic	Welder	Food Preservation Technician
Carpenter	Hotel Manager	Diesel Engine Mechanic	Packaging Technician	Food Packaging Technician
Construction Electrician	Food and Beverage Service	Heating and Ventilation Technician	Quality Controller	Meat and Poultry Processing Worker
Painter	Catering Service	Auto Mobile Electrician	Electrical Technician	Fish and Seafood Processing Worker
Interior Designer	Reservation Executive	Repair Service Technician	Assembler	Dairy Processing Worker
Foundation Worker	Chef/Cook	Mechanical Fitter	Junior Mechanic	Refrigeration Technician
Demolition Worker		Auto AC Technician	Consumer Electronic Technician	Waste Management
Heavy Equipment Operator		Machinist	Sales And Marketing Executive	
Aluminum Fabricator			Marine Engine Technician	

Challenges and opportunities

The ILO's focus on leaving no one behind is evident in its project targeting women and youth in Chattogram–Cox's Bazar region. Despite positive strides, there is a need for tailored regional policies, especially in Chattogram, where industry-specific challenges and the absence of a coordinating platform impede effective TVET implementation. Challenges include disparate course offerings, a lack of sector-specific data, and inadequate monitoring mechanisms.

The funding landscape varies for different skills development organizations, ranging from government supported TVET providers to private entities and NGOs relying on development donors. Industry–TVET provider linkages face challenges, leading to a preference for experienced candidates over certified fresh graduates. The TVET sector grapples with course delivery challenges, dropout rates, and limited access in remote areas.

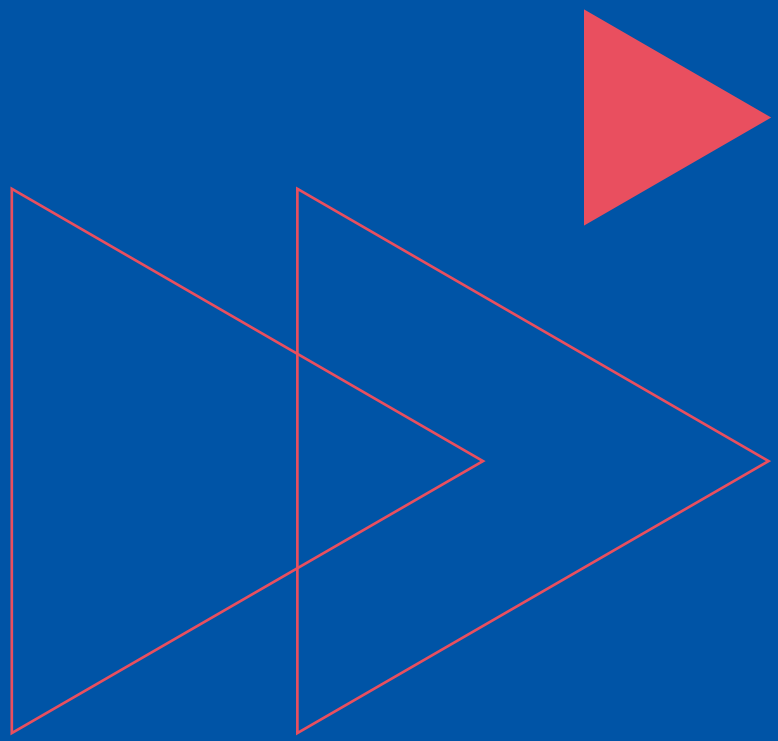
To address these issues, a comprehensive approach is required, emphasizing regional policies, effective governance, stakeholder coordination, industry linkages, and inclusive, accessible training programmes. Skills development is crucial for the sustainable growth of Chattogram and Cox's Bazar, particularly in construction, manufacturing, transport, agri-food processing, and tourism and hospitality sectors. Investing in skills development is seen as a strategic measure to unlock the economic potential of these regions, promoting sustainability and prosperity.

Implications for future growth

This comprehensive study underscores the pivotal role of skills development in driving the sustainable growth of the Chattogram–Cox's Bazar region. Aligned with future growth goals, the study addresses specific needs and challenges across key sectors—construction, tourism and hospitality, transportation, manufacturing, and agri-food processing. By pinpointing the skill needs and gaps, and proposing the targeted interventions, the study offers a roadmap for stakeholders to enhance the quality and relevance of TVET programmes. In construction sector, recommendations emphasize skilled workforce development through improved training and strategic collaborations. The tourism and hospitality sector highlights the importance of skills in front desk service delivery, digital literacy, and environmental management. The transport sector calls for focused efforts on automotive technicians' training, and the manufacturing sector underscores the need for continuous skill development. In the agri-food sector, the study identifies priority occupations and stresses the importance of comprehensive training and entrepreneurship initiatives. Overall, these findings stress the significance of skills development in unlocking economic potential, promoting inclusivity, adaptability, and competitiveness, contributing to sustainable regional growth.

1

Introduction



Chapter 1. Introduction

▶ 1.1. Regional economic landscape

Chattogram, a key city in Bangladesh, holds about 40 per cent of the nation's heavy industries and is a significant hub for the ready-made garment sector (The Daily Star 2015). In 2010, Chattogram had the lowest poverty rate among major Bangladeshi cities, at 26.2 per cent, which can be attributed to its high employability rate (Bangladesh, BBS 2011), with the city's 2012 labour participation rate standing at 56.2 per cent, slightly higher than Dhaka's (Bangladesh, BBS 2013a). Chattogram's vibrant economy, dominated by industrial firms, offers abundant job opportunities, particularly in the apparel industry, which employs two-thirds of the city's workforce. Chattogram's industrial output, international trade and contribution to government revenues are substantial, accounting for 40 per cent of Bangladesh's industrial output, 80 per cent of international trade, and 50 per cent of government revenue as of 2016 (Mazumdar 2016). Additionally, the Chattogram–Cox's Bazar region shows potential in steel, tourism and shipbuilding industries. The Chattogram Export Processing Zone (CEPZ) employs over 150,000 people, contributing 11 per cent to gross domestic product (GDP) and over 50 per cent of Bangladesh's tax revenue (Muzzini and Aparicio 2013, as cited in Mia et al. 2015). The city is projected to become a regional manufacturing hub due to its rapid growth and attractiveness to investors. In 2010, it was ranked as the tenth-fastest growing city globally, with the CEPZ excelling in economic potential and cost competitiveness (Mia et al. 2015).

Cox's Bazar district, with a population of 3.2 million, including 0.9 million Rohingya refugees, faces challenges such as poor land quality and frequent natural disasters. It has a higher poverty rate, with 17 per cent living below the upper poverty line and 8 per cent below the lower poverty line (Lemma et al. 2018). Despite these challenges, its tourism and hospitality sector shows high potential for future employment opportunities. The district is also expected to see growth in the construction industry, indicated by developments such as the Marine Drive, the Cox's Bazar airport expansion, and new roads and highways. As per a study conducted in 2018, Cox's Bazar contributes 2.1 per cent to the national GDP from agriculture, 1.2 per cent from industry, and 1.2 per cent from services, suggesting significant development potential in these sectors (BRAC 2021).

The nearby districts of Bandarban, Rangamati, and Khagrachari are gaining economic significance despite their current challenges. As per the 8th Five Year Plan, Bandarban and Khagrachari are among the poorest districts in the country, with poverty rates of 63 per cent and 53 per cent, respectively, ranking them third and sixth in terms of poverty. Rangamati, while not in the top ten, still faces a high poverty rate of 28.5 per cent. However, these areas are undergoing various development initiatives aimed at sustainable growth. A key project is the construction of a 317-kilometer border road linking Bandarban, Rangamati, and Khagrachari, which is expected to significantly enhance the economy and connectivity of these districts (Bangladesh, GED 2020). Furthermore, there is a focus on developing ecotourism and community-based tourism in compliance with local laws and acts, including those from the Hill District Councils, Chattogram Hill Tracts Regional Council, and Ministry of Chattogram Hill Tracts Affairs. This approach aims to generate revenue and boost the contribution of these districts to the national economy. With these plans and developments, substantial growth in GDP and employment opportunities is anticipated in the Chattogram Hill Tracts region.

Considering the growth sectors of the Chattogram–Cox's Bazar region – such as construction, tourism and hospitality, transport, manufacturing, and agri-food – it is important to study sectoral demand and challenges in terms of recruiting skilled human resources for future development and alignment with the national and regional economic development goals. This report addresses this need by examining skills demand and supply for priority sectors in the Chattogram–Cox's Bazar region.

▶ 1.2. Rationale of the study

The ILO initiated a project which purposes to strengthen technical and vocational education and training (TVET) providers and TVET systems in five priority sectors – construction, transport, tourism, manufacturing, and agri-food – by implementing various types of TVET and skills development interventions. The focus will be on TVET in the Chattogram region, with a particular emphasis on Cox's Bazar.

To support this intervention, the ILO planned to conduct a double-faceted assessment that includes industry skills demand and anticipation as well as skills supply, to not only determine skills needs at the industry level, but also to map the current skills supply scenario in the Chattogram–Cox's Bazar context. The study identifies in-demand occupations within the five priority sectors, the barriers faced by female trainees, and the challenges to be addressed by the project. The recommendations from this study will focus on promoting the Bangladesh National Qualifications Framework (BNQF) in Cox's Bazar so that a skilled workforce can be delivered to local industry.

▶ 1.3. Objective of the study

There were two sets of objectives for the study: one for the skills needs/anticipation assessment and one for the skills supply assessment, as follows.

Skills need/anticipation assessment:

- To conduct a skills needs assessment and anticipation study for host communities in the Chattogram–Cox's Bazar region focusing on five key economic sectors – construction, tourism, transport, manufacturing, and agri-food.

Skills supply assessment:

- To provide a rapid skills supply-side mapping of TVET services available in the Chattogram–Cox's Bazar region.
- To provide a more comprehensive skills supply-side mapping of TVET services offered by public, private, and non-governmental organization (NGO) provides in Cox's Bazar district (nine *upazilas*);
- To assess the capacity of selected local TVET providers in Cox's Bazar.
- To assess the current access barriers for women, people with disabilities, and other vulnerable groups to TVET and wage/self-employment opportunities.

▶ 1.4. Geographical and economic sector scope

This study covers the districts of Bandarban, Khagrachari, Rangamati, Chattogram and Cox's Bazar, which is denoted in this study as the "Chattogram–Cox's Bazar region". The five priority economic sectors covered in the study – construction, tourism, transport, manufacturing, and agri-food – were selected for their current and potential contributions to the broader economy of the Chattogram–Cox's Bazar region.

▶ 1.5. Methodology

The study followed a mixed methodology approach, using both qualitative and quantitative elements under the ILO's Skills for Trade and Economic Diversification (STED) Methodology (figure 1). Data was gathered through extensive desk review, surveys, key informant interview (KIIs) and focus group discussions (FGDs). For the desk research, relevant information was pulled from a variety of sources, including policies, reports and other documents. The study teams designed the survey questions, which were validated by experts.

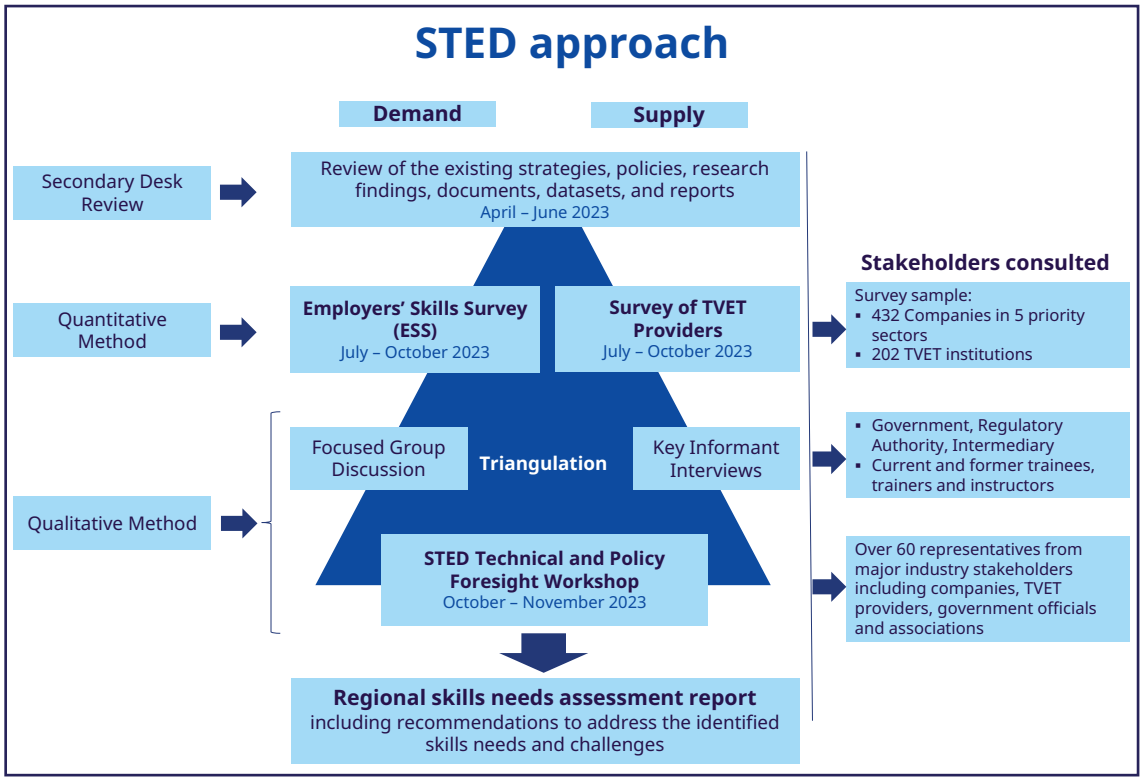
The STED approach aims to help stakeholders in carrying out strategic skills needs anticipation assessments for each target sector, including analysis of a sector's position and prospects; what it must strengthen to achieve that vision for the future; how skills can contribute to this; and what the plan of action should be. The primary objective of the STED approach is to support the growth of sectors with the potential for expansion, increased exports, and significant contribution to economic diversification, while ensuring the creation of decent employment opportunities.

The STED approach involves six distinct stages:

- **1. Characterization of the sector's business environment and envisioning for future of sector:** This initial stage profiles the sector, assessing its competitive position and global market outlook, leading to the formulation of a realistic yet ambitious growth scenario.
- **2. Analysis of business capabilities:** Stage two delves into the intricacies of the growth scenario, focusing on the essential business capabilities that firms must acquire to achieve it.
- **3. Identification of required skills:** The third stage identifies the specific skills that the workforce needs to to enable businesses in the sector to develop each business capability identified outlined in stage two.
- **4. Analysis of available skills supply and identification of priority systemic constraints in skills supply and provision of skills development:** This phase delves into understanding the supply of skills and identifying priority systemic constraints that affect the ability of education and training systems to supply the skills needed by employers and workers in the sector, considering the evolving sectoral landscape.
- **5. Identification of critical skills gaps:** Stage five matches the outcomes of stage four with an analysis of the current supply of skills to pinpoint crucial skills gaps within the sector.
- **6. Policy recommendations:** The final stage entails the development of concrete policy recommendations at various levels – policy, institutional and enterprise – aiming to effectively address and rectify the identified skills gaps and systemic skills constraints.

These six stages have been thoughtfully integrated into the methodology and framework of this study, as described in subsequent sections. The approach has been customized to the unique context of the Chattogram–Cox's Bazar region, ensuring a comprehensive analysis of the selected sectors and a tailored strategy for skills development and economic diversification in the region.

▶ Figure 1. Overview and timeline of the skills demand and supply assessment in the Chattogram–Cox's Bazar region



As noted above, this study involved two distinct components: (i) a skills needs assessment; and (ii) a skills supply assessment

The aim of the skills need assessment was to collect data through an Establishment Skills Survey (ESS), which involved surveying enterprises in the five priority sectors in the Chattogram–Cox's Bazar region concerning their skills use and needs. The ESS went beyond the simple detection of occupational changes to enquire about the types, levels and compositions of skills that individuals need to have to carry out the jobs required by enterprises. A total of 432 enterprises in the five priority sectors were surveyed under the ESS.

Similarly, for the skills supply assessment a survey was conducted with 202 TVET providers. The formal providers surveyed for the study were purposively selected from a complete list of registered TVET providers within the Bangladesh Technical Education Board web portal. However, for TVET providers that provide informal training there is no authoritative list available. Therefore, to map and survey these providers, the study team used a snowball sampling approach across the five target districts.

Table 1 below provides a summary of the numbers of enterprises and TVET providers surveyed in each of the five districts in the Chattogram-Cox's Bazar region.

▶ A. Skills demand assessment

▶ Table 1. Overview of the geographic distribution of survey respondents for the skills demand assessment by district

Sector	Chattogram	Bandarban	Khagrachari	Rangamati	Cox's Bazar	Total
Construction	5	2	1	3	3	14
Manufacturing	138	7	18	18	36	217
Transport	47	2	4	3	19	75
Tourism	72	8	11	7	28	126
Total	262	19	34	31	86	432

Note: The above sample distribution for the skills demand assessment was further stratified according to the classification of industries and enterprises as large, medium, small, and micro, as per the Bangladesh National Industry Policy 2022.

▶ B. Skills supply assessment

▶ Table 2. Overview of the geographic distribution of survey respondents for the skills supply assessment, by district

Type of TVET provider	Chattogram region	Cox's Bazar	Total
Government TVET providers	41	10	61
Non-governmental/ NGO-operated TVET providers	16	10	26
Private TVET providers	109	16	125
Total	166	36	202

Additionally, for the skills demand assessment, 13 FGDs and 5 physical observations were conducted with employers and business owners, and 39 KIIs were conducted with government officials, chambers of commerce, EPZ officials, and NGO/INGO officials. For skills supply assessment, 25 KIIs were conducted with major stakeholders and labour market intermediaries, and 18 FGDs were conducted with current TVET trainees/students, TVET graduates, and TVET trainers and instructors. Details of the KIIs and FGDs are shown in annex tables 14–17.

▶ 1.6. Limitations of the study

This study has some limitations that need to be considered while interpreting and drawing insights from the results. Notable limitations for the study include:

- The overall sample size for both the demand and supply side assessments are not large enough to capture all subsectors within the five priority sectors targeted.
- For the skills supply assessment, it was difficult to categorize information at the sectoral level, as TVET providers generally do not keep sector-specific information. Similarly for the demand side assessment, disaggregation by subsector was not possible due to relatively small sample size.
- There are notable gaps in available information regarding informal courses, such as trends around enrollment and graduation, as informal providers generally did not keep consolidated information on hand.
- Due to the informal nature of much of the agri-food sector, it was not practicable to conduct a skills demand survey in that sector. As such, the assessment for skills demand for that sector is based entirely on qualitative data from KIIs and FGDs.

▶ 1.7. TVET and the skills ecosystem of Bangladesh

1.7.1. The TVET ecosystem

The TVET system is based on the National Skills Development Policy (NSDP), which was adopted in 2011 and aims to create a skilled and productive workforce that can contribute to the country's economic and social development. The NSDP envisions a demand-driven, competency-based and inclusive skills system that provides quality training and lifelong learning opportunities for all. The TVET system is also guided by the National Technical and Vocational Qualifications Framework (NTVQF) that was developed in 2011 and provides a common reference for the recognition and certification of the skills and qualifications of the TVET graduates. The NTVQF consists of six levels, from level 1 (basic skills) to level 6 (advanced skills), and covers various occupational areas and sectors.

In Bangladesh's TVET sector, a number of agencies play crucial roles. The Directorate of Technical Education oversees the management of public TVET providers under the Ministry of Education, offering both technical and academic support. The Bangladesh Technical Education Board (BTEB) serves as the apex body for regulating and accrediting TVET providers and programmes, maintaining the NTVQF, and developing the competency standards and curricula. The National Skills Development Authority (NSDA) coordinates and oversees the entire TVET system, ensuring alignment with national development goals and industry needs. The NSDA also oversees the Industry Skills Councils (ISCs), which collaborate with TVET providers and the Government to identify skill needs, provide input on standards and curricula, and offer apprenticeship and employment opportunities, fostering a direct link between the TVET system and industry demand. The Bureau of Manpower, Employment, and Training under the Ministry of Labour and Employment manages public TVET providers and provides skill development and employment services to both local and overseas workers.

The TVET Institution Census 2015 determined that there were a total of 1,959 TVET providers in Chattogram Division (11 districts), with 813 (42 per cent) in rural areas and 1,146 (58 per cent) in urban areas. According to the census, TVET providers in Chattogram Division offered more than 11,000 places for training in different trades, and the male-to-female ratio among trainees was 6:4.

Concerning the five target districts for this study, the census found that there were 829 TVET providers with seat capacity of more than 11,000 Chattogram had by far the largest number of TVET providers among the five target districts (569), while Bandarban had 45; Cox's Bazar, 92; Khagrachari, 76; and Rangamati 47.

According to TVET Institution Census 2015, Cox's Bazar district ranked 11th from the bottom of a list of 64 districts in terms of the number of TVET providers, and can be considered a lagging district in terms of number of TVET providers and seat capacity. Among the 92 TVET providers in Cox's Bazar, 50 are in rural areas and 42 in urban areas. Additionally, study revealed that around 80 per cent of the providers provide ICT-based computer application training.

1.7.2. Labour force status

The population of youth not in education, employment or training (NEET) in Bangladesh is estimated to be about 8 million, or 27 per cent of the youth population (World Bank 2023). The NEET population is disproportionately composed of females, who account for about 90 per cent of NEET youth. The NEET population is also mostly concentrated in rural areas, where the opportunities and services for education and employment are limited.

According to a study by the Bangladesh Institute of Development Studies, the skills gap in ten industrial sectors[1] in Bangladesh is about 30 per cent. The gap is higher for sectors that require more technical and sophisticated skills, such as ICT, shipbuilding and large-scale electronics. The gap is also higher for senior-level positions, such as managers, professionals, technicians and craftsmen (Bangladesh, Ministry of Finance 2017). The main causes of the skills gap in Bangladesh are:

- the mismatch between the skills of workers and the demands of the labour market;
- the lack of quality and relevant education and training;
- the limited access to finance and entrepreneurship support; and
- the social and cultural barriers that hinder the participation of women and minorities.

These issues continue to persist, but it should be noted that major government actors, such as the BTEB and NSDA, and a number of NGOs have introduced a few comprehensive initiatives to address skills gaps in Bangladesh. These include formal and non-formal upskilling and reskilling programmes that have been launched even in hard-to-reach areas to mitigate persistent skills gap issues.

▶ 1.8. Systematic constraints analysis

1.8.1. Regional skills policy and strategy

Although the National Skills Development Policy (NSDP) 2022 and the National Action Plan for Skills Development 2022–2027 are in place, these overarching frameworks aim to create a sustainable and responsive skills development environment nationwide at the macro level, and specific strategies for Chattogram–Cox's Bazar region are noticeably absent. The absence of region-specific policies became particularly evident through KIIs and STED foresight workshops held for the study, which revealed a lack of tailored approaches to address the unique needs of growing sectors in the region.

Stakeholders, including government, private sector, civil society, and development partners, participated in the STED foresight workshops/FGDs for this study that highlighted the deficiencies in registered TVET providers with regard to provision of demand-driven courses. These providers often struggle

1 These industries include: agri-processing, construction, leather, light engineering, healthcare, hospitality and tourism, readymade garments and textiles, shipbuilding and electronics.

to customize their skill programmes according to regional demand, and there is also a shortage of registered training organizations offering advanced-level courses in the Chattogram–Cox's Bazar region.

The identified gaps underscore the necessity for a coordinated system at the regional level that bridges the divide between skills supply and demand. Stakeholders emphasized the importance of a regional policy that is aligned with the national framework but that specifically caters to the skill demands of burgeoning industries in the Chattogram–Cox's Bazar region. Addressing these gaps is paramount to ensuring that regional skills development initiatives align with local job markets, that resources are allocated effectively, and that skills development programmes contribute to the economic growth and empowerment of the workforce in the region.

1.8.2. Governance and stakeholder coordination

The NSDA is the prime authority overseeing the overall governance and stakeholder coordination of the skills development sector. But they are not present at the regional level to ensure regional coordination. In addition, Industry Skills Councils (ISCs) are generally responsible for industry–training institution coordination, but most of the ISCs are only moderately active and do not engage in significant amounts of activity in regional areas. As a result, several challenges impede the implementation of market-driven skills supply, highlighting issues related to governance and stakeholder engagement. The following challenges are some of the major systematic issues identified:

- **Absence of a coordinating platform**: The lack of an active coordinating platform hinders effective communication between employers and TVET providers. This deficiency limits the exchange of ideas and collaborative planning, making it difficult to align skills development with market needs.
- **Disparity in course offerings:** The simultaneous provision of both formal and informal courses, as well as the offering of both Competency-Based Training and Assessment (CBT&A) and traditional certificate courses, creates variations in standards. This duality results in confusion among employers, as they grapple with different qualifications.
- **Lack of sector-specific data:** The absence of sector-specific demand-side data, such as information on priority occupations and annual labour requirements, leaves TVET providers without clear insights. This leads to a skills development approach that is agnostic to industry demand, which hampers the relevance of training programmes.
- **Employers reluctant to hire TVET graduates:** There is a perception among employers that TVET graduates have unacceptable knowledge gaps, suggesting a misalignment between the skills acquired through TVET programmes and the practical requirements of the job market, which results in reduced employability.
- I**nadequate monitoring and evaluation:** The absence of robust monitoring and evaluation mechanisms limits the ability to measure the impact and effectiveness of skills development interventions. Without proper assessment tools, it becomes challenging to gauge the success of initiatives and to make informed adjustments for continuous improvement (Haolader and Nickolaus 2012).

1.8.3. Sources of funding for different types of TVET providers

Different types of skill development organizations in Bangladesh have different funding mechanisms and modes of operation. The government-supported organizations – such as polytechnics, technical schools and colleges (TSCs) and Technical Training Centers (TTCs) – receive subsidies from the Government as well as from donors to cover their operating costs, including infrastructure costs. The students who enroll in these organizations pay a minimal amount of fees for tuition, examinations and residential facilities. Private institutions, on the other hand, are entirely dependent on students' tuition fees, unless supported by donors. A few industries run fee-based commercial training programmes independently, or occasionally fund training programmes to acquire trained resources for their own industries. This approach allows industries to directly address their specific workforce needs.

1.8.4. Industry–TVET provider linkages and support for work-based learning

In the current employment landscape, industries predominantly rely on reference-based recruitment for hiring workers. Practical experience holds more weight than formal certification. Despite acknowledging the value of certificates, industries rarely hire certified graduates for roles in entry level positions, instead favouring experienced candidates. Both industry and TVET providers acknowledge a lack of effective communication and connection in terms of placing certified graduates. TVET providers face challenges in securing placements or facilitating workplace-based learning for graduates. There is a noticeable reluctance from the industries to accommodate trainees for on-the-job training, contributing to a gap in real-world experience for aspiring workers, which is crucial for their entry into the job market and adaptation to evolving technologies.

1.8.5. Course delivery and assessment challenges

There are four types of formal programmes offered by TVET providers, which enable trainees to earn the following certifications:

- **Diploma:** A four-year programme covering theoretical and practical aspects in fields such as engineering and tourism. Awarded by technical institutions, diplomas enable graduates to work as skilled technicians or supervisors**.**
- **HSC (Vocational)[2] :** A two-year programme equivalent to a higher secondary education, and offering trade options such as electronics and computer science. Graduates can pursue further education through diploma or degree programmes.
- **SSC (Vocational)[3] :** A two-year programme equivalent to a secondary education, providing basic technical skills in trades such as masonry and electrical work. Graduates can continue on to the HSC (Voc) or diploma programmes.
- **National Skills Certificate (NSC):** Issued by both the BTEB and NSDA, NSCs recognize skills through a six-level framework. Certificates are attainable through formal, non-formal or informal learning aimed at employment, career growth or further education.

In addition, there are **informal certificate courses**, which are typically short-term courses provided by NGOs or private institutions to address skills training and awareness for marginalized groups. These courses are not regulated by the BTEB or NTVQF, and cover diverse topics to cater to basic skills orientation for entry level workers and potential entrepreneurs.

The TVET providers delivering formal courses at the diploma, HSC (Voc), SSC (Voc) and NSC levels in the construction sector adhere to a standardized assessment system led by assessors certified in Competency-Based Training and Assessment (CBT&A). In contrast, traditional and informal courses typically involve industry insiders and sector experts for assessment, without any requirement for certified assessors. KIIs with TVET providers highlighted significant challenges, particularly in the recruitment of certified trainers and suitable assessors. This difficulty is more pronounced in remote regions such as the Chattogram Hill Tracts districts and Cox's Bazar. This shortage of qualified trainers poses a hurdle for TVET providers in initiating and maintaining courses. Additionally, there is a notable scarcity of female trainers, which particularly impacts female trainees. The unavailability of female trainers has led to lower enrollment and higher dropout rates among female trainees, although precise

2 The abbreviation HSC refers to "Higher Secondary Certificate". Henceforth, the term "HSC (Vocational)" will be written as "HSC (Voc)".

3 The abbreviation SSC refers to "Secondary School Certificate". Henceforth, the term "SSC (Vocational)" will be written as "SSC (Voc)".

data on these outcomes is lacking. This underscores the need for strategies to address gender-specific challenges in the recruitment of trainers, particularly in remote and underserved areas.

According to the heads of TVET providers, trainers currently possess sufficient expertise in their particular subject matters, but they can face a deficiency in awareness of new and innovative technologies due to limited access to refresher training and skill upgrading programmes. This limitation impedes the delivery of training on contemporary and market-driven skills. KII participants emphasized the need for accessible refresher and skill-upgrading training, particularly training that focuses on modern work approaches. Such initiatives would contribute to the development of skills resources aligned with market and industry demand.

TVET providers also face several challenges in implementing Recognition of Prior Learning (RPL) programmes. RPL programmes allow individuals to secure certification or earn programme credit based on their ability to demonstrate mastery of skills that they learned outside the TVET provider, including through previous employment. One major hurdle is the lack of awareness and understanding among potential candidates regarding the benefits of RPL. Institutes often struggle to effectively communicate the value of recognizing and accrediting prior skills and experiences. Additionally, there may be insufficient resources and infrastructure to conduct thorough assessments of candidates' prior learning. Furthermore, inadequate awareness and motivation among learners, especially women and marginalized groups, contribute to low participation stemming from insufficient information, guidance, and incentives for RPL involvement. These challenges collectively impede the successful implementation and acceptance of RPL initiatives.

In terms of tracking graduates' outcomes, TVET providers routinely follow up with recent graduates to monitor their employment or industry success. NGOs conducting training often engage in informal follow-up as part of donor obligations. Additionally, some larger for-profit training providers undertake informal follow-ups to assess success, utilizing tracer information for branding and promotional purposes. However, there is a lack of substantial data indicating that TVET providers actively undertake measures to enhance their curriculum based on the findings from tracer studies.

1.8.6. Access to training

Consultations with stakeholders and FGDs involving trainees and graduates highlighted the limited access to TVET providers in the Chattogram Hill Tracts and Cox's Bazar. This was attributed to a shortage of registered training centres offering diverse courses. Various barriers contribute to the restricted access to TVET providers, with notable factors including:

- **Societal issues for females:** In some areas, women face social constraints if they want to participate in this kind of training.
- **Less opportunity for females in particular sectors:** The construction sector, for instance, is heavily dominated by male employees, as it involves intensive physical labour. Because of the environment this creates, potential female workers often lose motivation when training for construction sector.
- **Lack of female trainers:** Lack of female trainers is another reason for the females not enrolling at TVET providers.
- **Absence of advance training:** Participants during FGDs in Cox's Bazar stated that even if they want to get advanced training (such as NSC level 3 or 4), they cannot get it in Cox's Bazar as no advanced training is available there.
- **Lack of awareness:** In many cases, people simply do not know which courses are available at which providers. This can be due to barriers around internet usage – be it lack of access or lack of digital literacy.

- **Financial barriers:** Financial barriers remain a prominent reason for not enrolling with training providers.
- **Distance is a problem:** Distance is deemed to be one of the primary obstacles for all potential TVET students in the Chattogram Hill Tracts. Most of the TVET providers are centred in urban/peri-urban locations, and the expensive cost of travel, coupled with inadequate transportation and hilly terrain, dissuade prospective students away from enrolling in training.
- **Inadequate residence system:** The problem of distance is compounded by inadequate residence facilities at TVET providers, making it that much more unappealing to travel in order to undertake training.
- **Lack of motivation and unclear career pathways:** Lack of motivation coupled with a consistent absence of linkages with industries drives people to stay away from the TVET providers in the Chattogram Hill Tracts. Success stories are not well-circulated among the masses.
- **Absence of inclusive infrastructure:** The absence of inclusive infrastructure is one of the primary barriers in all TVET providers for persons with disabilities.
- **Absence of inclusive curriculum:** For persons with disabilities, there are no specific curricula at TVET providers to meet their needs, which also lead them to not participate in training.

1.8.7. Dropout status

Statistics on the dropout rate for different TVET certification level were extracted from Bangladesh Bureau of Educational Information and Statistics (BANBEIS) database. According to the Bangladesh Education Statistics 2022, the dropout rate for SSC (Voc) programmes was 29.32 per cent in 2022 and 30.19 in 2021. The dropout rate for HSC (Business Management and Technology) programmes was 44.57 per cent in 2022 and 44.84 per cent in 2021. And at the diploma level the dropout rate stood at 7.68 per cent in 2022 and 7.82 per cent in 2021 (table 2). Unfortunately, there are no official statistics available concerning the dropout rate for TVET programmes by sector, so it was not possible to determine the rates for programmes relevant to the priority sectors considered in this study.

▶Table 3. Dropout rates by education level and sex, 2020–22 (%)

Education level	2022			2021			2020		
	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female
SSC (Voc)	29.32	31.62	28.02	30.19	32.09	28.25	30.22	30.09	29.80
HSC (BMT)	29.32	31.62	28.02	44.84	46.03	44.66	45.10	47.63	43.05
Diploma	7.68	7.57	7.80	7.82	7.63	8.01	7.86	7.94	8.11

HSC (BMT) = Higher Secondary Certificate (Business Management and Technology). Source: Bangladesh, BANBEIS 2022; 2023.

As the data in table 2 clearly indicates, the dropout rate of male students is higher than that of female students at the SSC and HSC levels. While at the diploma level the dropout rate of female students is slightly higher than that of male students.

Based on the KIIs the observed dropout rates in skills development programmes can be largely attributed to two main types of courses. Firstly, in free-of-cost courses, trainees may enroll without a clear vision or strong personal motivation. Influenced by peer pressure or external factors, they might lack a genuine commitment to completing the programme, resulting in a higher dropout rate. Secondly, longer-duration courses (mostly observed for courses requiring more than 3 months of training) pose a challenge, as trainees may lose motivation midway through the programme. Sustaining interest and commitment over an extended period can be challenging, leading to a decline in engagement and higher dropout rates.

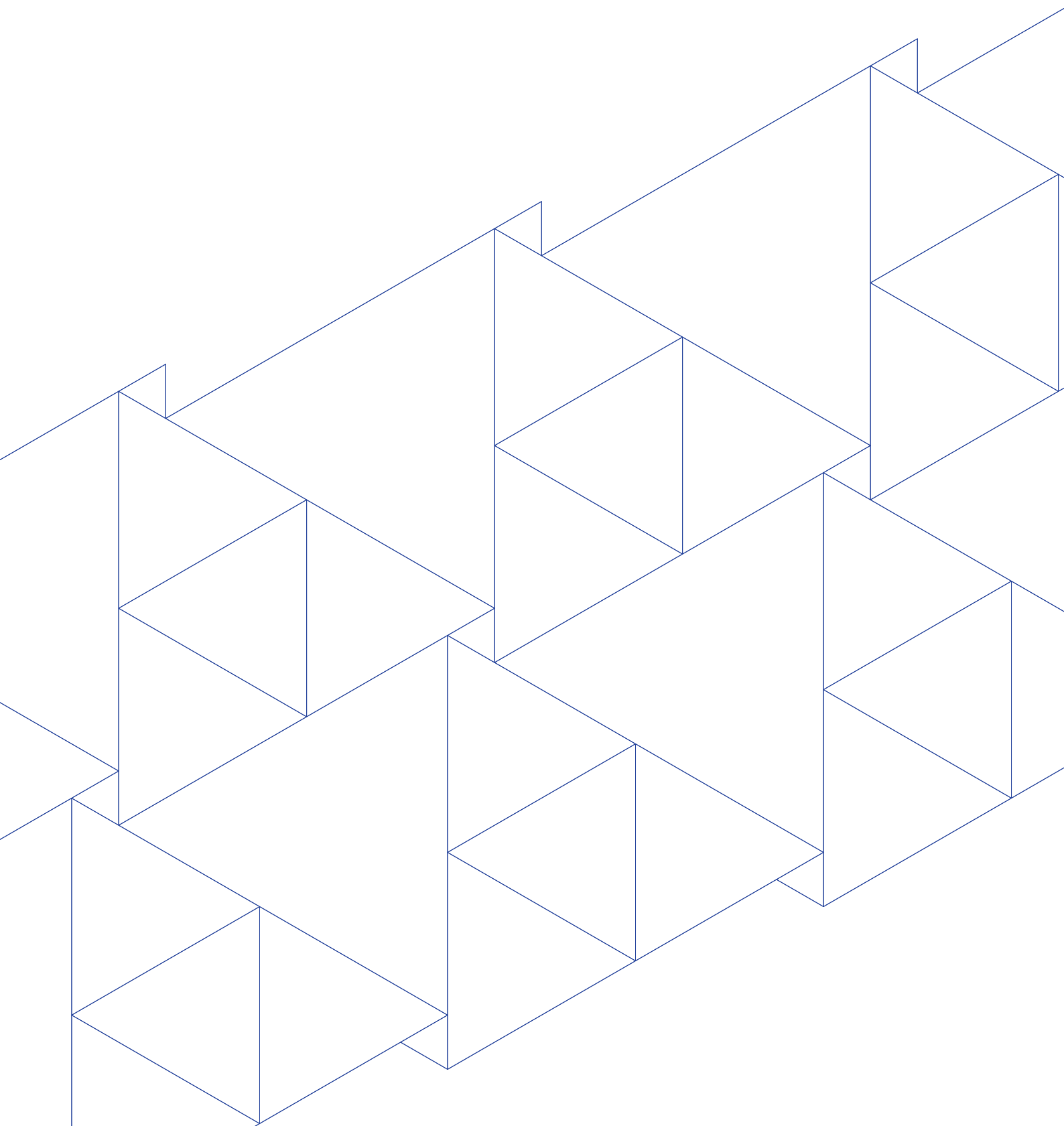
Beyond the main types of courses involved, the reasons contributing to the dropout rate in skills development programmes are diverse and multifaceted. Financial constraints emerge as a prominent factor, as they some individuals find they cannot continue to afford their course. Societal barriers, particularly prevalent for females, such as early marriages, pose challenges to sustained enrollment. Unclear career pathways and a lack of motivation, particularly for subsidized courses, contribute to wavering commitment among participants. Inadequacies in the selection process, including challenges in identifying candidates who are the right fit for specific sectors, further exacerbate the dropout rate. Geographical factors, such as the distance between home to the training centre, also serve as a barrier.

▶ 1.9. Anticipated impact of the regional skills needs and supply assessments

The skills demand and supply assessments conducted for this study in the Chattogram–Cox's Bazar region are anticipated to yield significant impacts for stakeholders. First, these assessments provide valuable insights for industries and businesses operating in the region by offering a comprehensive understanding of current and future demand for specific skills. This foresight can enable businesses to align their recruitment practices with the evolving needs of the local economy, ensuring a more efficient and tailored approach to workforce development. Additionally, the assessments shed light on the effectiveness of the TVET sector in addressing industry demand.

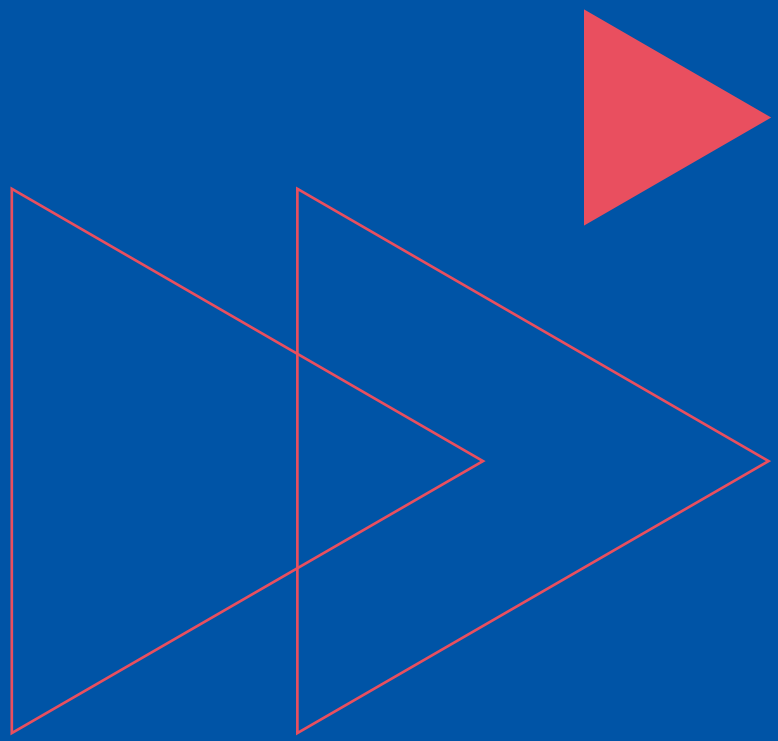
By assessing various training programmes, the research also helps stakeholders, including educational institutions and government bodies, to identify successful initiatives and areas for improvement within the TVET sector. Moreover, the assessments are instrumental in pinpointing gaps between the skills demanded by industries and the skills actually supplied by the current workforce. This insight can aid policymakers, educational institutions, and industry players in crafting targeted strategies to bridge these gaps. Whether through curriculum enhancements, the introduction of new training modules, or the establishment of industry partnerships, the findings offer a roadmap for optimizing the TVET sector's contribution to skill development in the Chattogram–Cox's Bazar region.

Ultimately, the anticipated impact of these assessments lies in fostering a more responsive, adaptive and symbiotic relationship between the TVET sector and the evolving needs of industries, thereby contributing to the overall economic growth and sustainability of the region.



2

Construction sector



Chapter 2. Construction sector

▶ 2.1. Profile and situation analysis for the construction sector

2.1.1. Economic profile

The construction sector in the Chittagong– Cox's Bazar region has a lot of potential for economic growth and development, with the many development projects in the region having already contributed to an expansion in the construction industry in the region. According to the Asian Development Bank (ADB), the region is part of the Trans-Asia Railway network that links South and South-East Asia, and has the potential to become a transport and transhipment centre for the subregion. The new 102-km Dohazari–Cox's Bazar section of the Chittagong– Cox's Bazar railway corridor has already been constructed with support from ADB, and is expected to boost the national economy through further development of Cox's Bazar into a major tourist destination, as well as facilitating access to subregional markets and trade. The project created about 14,000 jobs during construction and 1,000 jobs during operation (ADB, n.d.-a). Besides the railway project, the construction sector in the region will also benefit from the development of tourism, fisheries and small and medium enterprises (SMEs). The ILO has identified these sectors as potential areas for intervention to improve economic opportunities for host communities in Cox's Bazar, which are hosting about 1 million Rohingya refugees. The construction sector will play pivotal role in providing infrastructure, services and employment for these sectors and the local population. As of 2022, the Bangladesh construction market size was US$33.37 billion (Bangladesh, Ministry of Finance 2023). This substantial market size reflects the sector's importance within the national and regional economy. The construction industry value addition is a significant contributor to the country's GDP.

2.1.2. Workforce profile

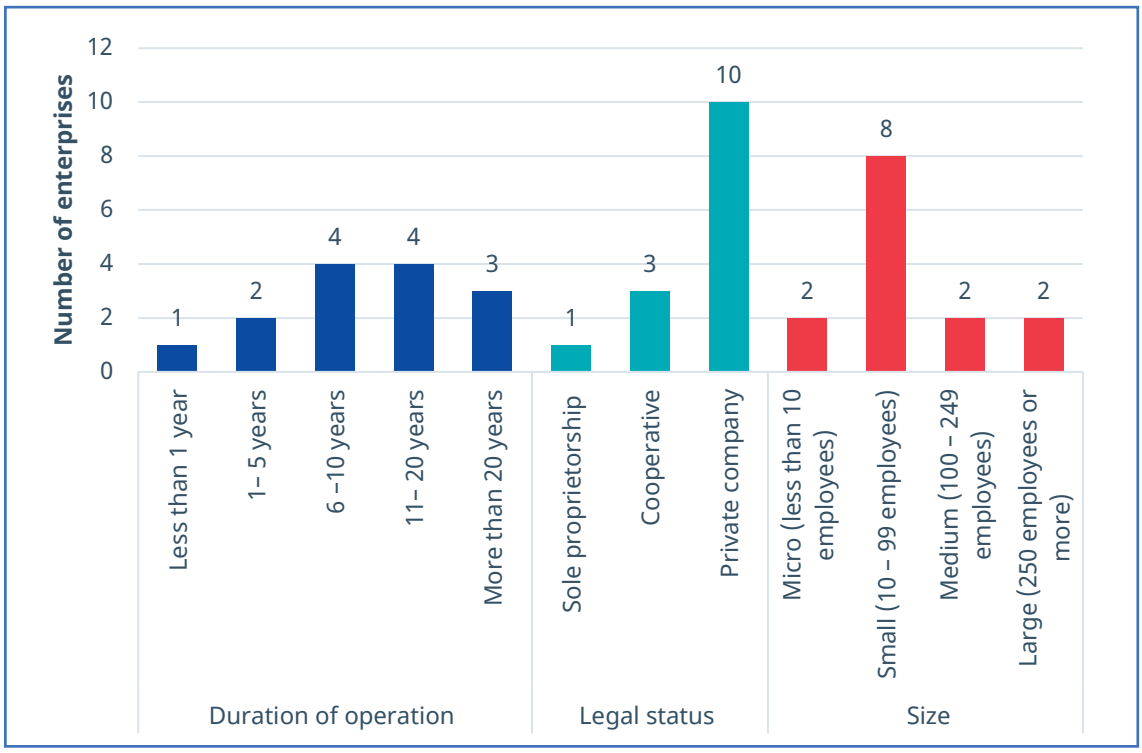
According to the Labour Force Survey 2022, 3.83 million workers are involved in construction sector in Bangladesh. The construction sector has been a crucial source of employment, providing both direct and indirect jobs and highlighting the sector's role in reducing unemployment and supporting livelihoods. Just as the sector is major employer at the national level, it can be expected that the construction in the Chattogram–Cox's Bazar region will also generate large employment numbers due to the recent development projects referred to above. The Chattogram–Cox's Bazar Highway project is expected to create huge employment opportunity (The Daily Sun 2023). In addition several policy implementations, such as the Bangladesh Regional Connectivity Project, the Bangladesh Delta Plan 2100, and the Bangladesh Vision 2021, are expected to create more demand for skilled and unskilled labour in the construction sector, as well as in other related sectors such as tourism, trade and manufacturing.

2.1.3. Business profile

The Economic Census 2013 suggests that the Chattogram–Cox's Bazar region has a total of 284 construction establishments, with Chattogram accounting for a solid majority (207). Rangamati, the district with the second-highest number of construction establishments lags far behind at just 29. This disparity demonstrates that most of the districts in the region are well behind Chattogram in terms of construction business. This may be due to these districts' remoteness and associated difficulty to access.

A total of 14 construction establishments of all sizes in the Chattogram–Cox's Bazar region participated in the Establishment Skills Survey (ESS) for this study. Among all surveyed establishments, 8 enterprises were of small (10–99 employees); 2 enterprises were micro (fewer than 10 employees); 2 enterprises were large (250+ employees); and 2 enterprises were medium (100–249 employees). By legal status, 10 enterprises were private companies, 3 enterprises were cooperatives, and 1 enterprise was a sole proprietorship.

▶ Figure 2. Overview of surveyed construction sector enterprises: Length of business operation, legal status and size of enterprise (no. of respondents, N=14)



Source: ESS 2023.

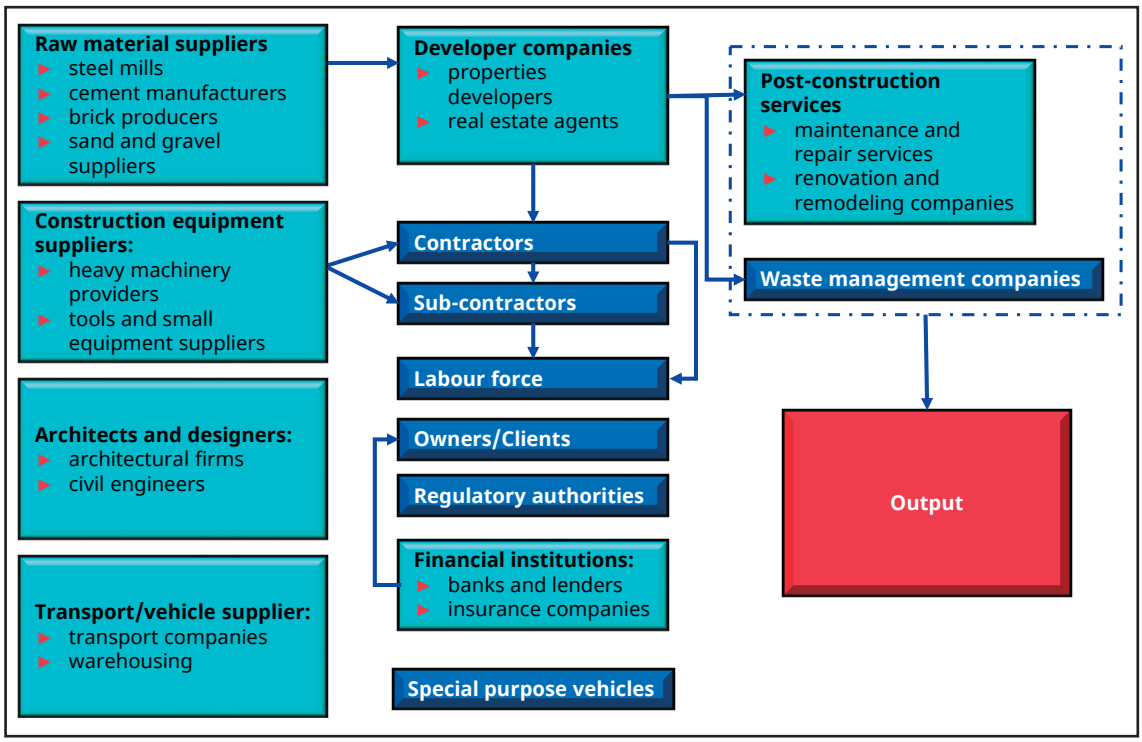
The construction enterprises surveyed exhibited a diverse array of business operation durations. Most has been in business for between 6–10 years or 11–20 years (29 per cent each), suggesting that a significant proportion of construction businesses in the region have moderate experience in the sector. A total of 21 per cent had been in business for more than 20 years, indicating a substantial presence of well-established construction businesses. Meanwhile, 14 per cent of the enterprises have been in operation for "1–5 years" and 7 per cent for "Less than 1 year" indicating a smaller share of relatively new businesses (figure 2).

2.1.4. Value chain analysis

Figure 3 presents a value chain diagram derived from insights obtained through consultations with sector representatives and various stakeholders in the STED foresight workshop. This value chain outlines the various stakeholders and elements involved in the construction industry from the initial raw materials to the final post-construction services. Each component plays a critical role in the successful delivery of a construction project.

At the start of the value chain are raw material suppliers who supply necessary building components, including steel, cement and bricks. While architects and designers establish the project's comprehensive designs, construction equipment suppliers provide the heavy machinery and tools required for building activity. Suppliers of vehicles and transportation make sure that supplies and machinery get to the building site.

▶Figure 3. Value chain of the construction sector



Source: Discussion with stakeholders in the Technical Foresight Workshop.

Developer companies are involved in project inception and finance, while contractors carry out the construction according to the plans. Specialized jobs may be handled by subcontractors, and both professional and unskilled workers physically construct the structure. The project is owned and financed by the owner/client, and financial institutions are involved for sourcing financial capital, while regulatory authorities enforce the rules and regulations. Special purpose vehicles can be employed for risk management and project financing.

Whether it is a building or infrastructure, the finished construction project is the ultimate result. Construction waste is disposed of responsibly by waste management companies, while post-construction services maintain and refurbish the structure going forward.

This value chain shows the sequential sequence of activities involving numerous interconnected stakeholders in the construction industry from project conception to completion, including ongoing maintenance.

2.1.5. Institutional mapping for the construction sector

The construction sector involves a variety of institutions and stakeholders, each having a crucial role in shaping the sector's landscape and ensuring the successful planning and execution of construction projects. These institutions can be categorized into various organizations, authorities and bodies. Below is a brief institutional map of the sector, a more detailed table of institutions is available in Annex 2 (annex table 3).

- **Government bodies and ministries:** These entities set policies and oversee various aspects of construction, including housing, transportation, energy, local development, and ports.
- **Regulatory bodies and authorities:** These organizations ensure compliance with construction-related regulations, covering economic zones, bridges, power generation, and urban development.
- **Industry associations and organizations:** Groups such as BACI, REHAB, and the Cement Manufacturers Association advocate for the interests of the construction and real estate sectors.
- **Educational and training institutions:** BUET and Technical Training Centers provide education, research, and vocational training for construction professionals and workers.
- **Financial institutions:** Bangladesh Bank and commercial banks offer financing and influence monetary policy for construction projects.
- **Development partners and donor agencies:** Entities such as the ADB, World Bank, and Japan International Cooperation Agency (JICA) collaborate to fund and provide technical assistance for infrastructure and construction projects.
- **Environmental and safety regulators:** The Department of Environment and the National Industrial Health and Safety Council (NIHSC) monitor and enforce environmental and safety standards at construction sites.
- **Local government bodies:** City Corporations, Municipalities, and Union Parishads have authority over urban planning and construction within their jurisdictions.

These stakeholders collectively contribute to the development and regulation of the construction sector in Bangladesh, ensuring its growth and compliance with standards and policies.

2.1.6. Analysis of the business environment: SWOT and drivers of change

To assess the business environment, this study conducted a strengths, weaknesses, opportunities and threats (SWOT) assessment for the construction sector involving various stakeholders in the foresight workshop of the sector. In an interactive session of the STED foresight workshop, stakeholders identified the following aspects relating to the construction sector.

- **Strengths**
  The Chattogram–Cox's Bazar region offers various advantages to the construction industry. It benefits from having easy access to a pool of human resources with relatively lower costs, helping to minimize the overall cost of projects. Furthermore, the ease of access to essential building supplies, such as cement and iron, in Chattogram, a significant industrial centre, streamlines the logistics of procuring resources. Furthermore, the industry is bolstered by development projects implemented by the Government of Bangladesh, such as fast-track programmes that generate growth and investment prospects in the region.

- **Weaknesses**
  In spite of these advantages, the construction sector has a number of internal problems. The region's labour force is significantly underqualified, which may have an effect on the effectiveness and quality of building projects. Additionally, there is a clear disregard for workplace safety procedures, which puts employees at risk. Moreover, the employment of trained resources is hampered by the poor cooperation between firms and TVET providers. Concerning task completion and quality assurance, the professionalism of employees is a matter to be concerned about. Furthermore, there appears to be a lack of adherence to construction regulations and norms, which may have an impact on the safety and quality of projects. Finally, there is a lack of public confidence in regional construction companies, which could harm the industry's standing and dependability.

- **Opportunities**
  The Chattogram–Cox's Bazar Region presents a number of favourable external chances for the construction industry. After Dhaka, Cox's Bazar is now the second location for Government of Bangladesh infrastructure development funds. This creates chances for a range of development projects, such as construction linked to the blue economy, tourism-supported construction, and offshore wind generation. The government's creation of a master plan is also anticipated to guarantee better cooperation amongst local players, thereby augmenting the sector's growth and development potential.

- **Threats**
  On the other hand, there are a number of external threats for the sector. Construction costs are 20 per cent to 30 per cent higher in the region due to geographic factors and disaster sensitivity, which may affect project feasibility and budgets. Another serious risk is political instability, which can sabotage major development initiatives and result in delays and uncertainty. Furthermore, the entry of foreign competitors into the local market, especially from China, presents difficulties for domestic construction companies in terms of competition, which could have an impact on market share and profitability.

▶ 2.2. Profile of major occupations

This section provides an overview of the key occupations identified by analysing both secondary and primary sources. While table 3 below provides only the major occupations in the construction sector, annex table 8 provides a more detailed list, along with the skills needed for each occupation and the level of priority that each occupation holds in the sector. These occupations have been identified through the ESS survey, secondary sources, FGDs and KIIs and subsequently validated by sectoral stakeholders in the STED Workshop.

▶Table 4. Major occupations in the construction sector

Construction of roads and railways	Construction of buildings
▶ Excavator Operator ▶ Crane Forklift Operator ▶ Civil Engineers ▶ Surveyor ▶ Geotechnical ▶ Engineers ▶ Geotechnical ▶ Technicians ▶ Structural Engineers ▶ Environmental Engineers ▶ Traffic Engineers	▶ Carpenters ▶ Masons ▶ Plumber ▶ Pipe Fitter ▶ Painters ▶ Electricians ▶ Construction Manager ▶ Supply Chain Manager ▶ Building Inspector ▶ Building Surveyor
	Specialized construction activities
	▶ Heavy Equipment Operator ▶ Tile Setter ▶ Rod Binder ▶ Interior Designer

In the construction of buildings subsector, occupations such as Carpenters, Masons, Painters and Electricians have been given a medium level of priority (again, see annex table 8 for the priority level for each occupation). This could imply a need for more skilled tradespeople in these areas, but not an immediate shortage. Occupations such as Construction Manager, Supply Chain Manager, Building Inspector, and Building Surveyor, among others, are fundamental to the construction process and while important, but are not considered to be in high or medium demand at present. These roles are likely well-staffed or there is a stable supply of qualified individuals.

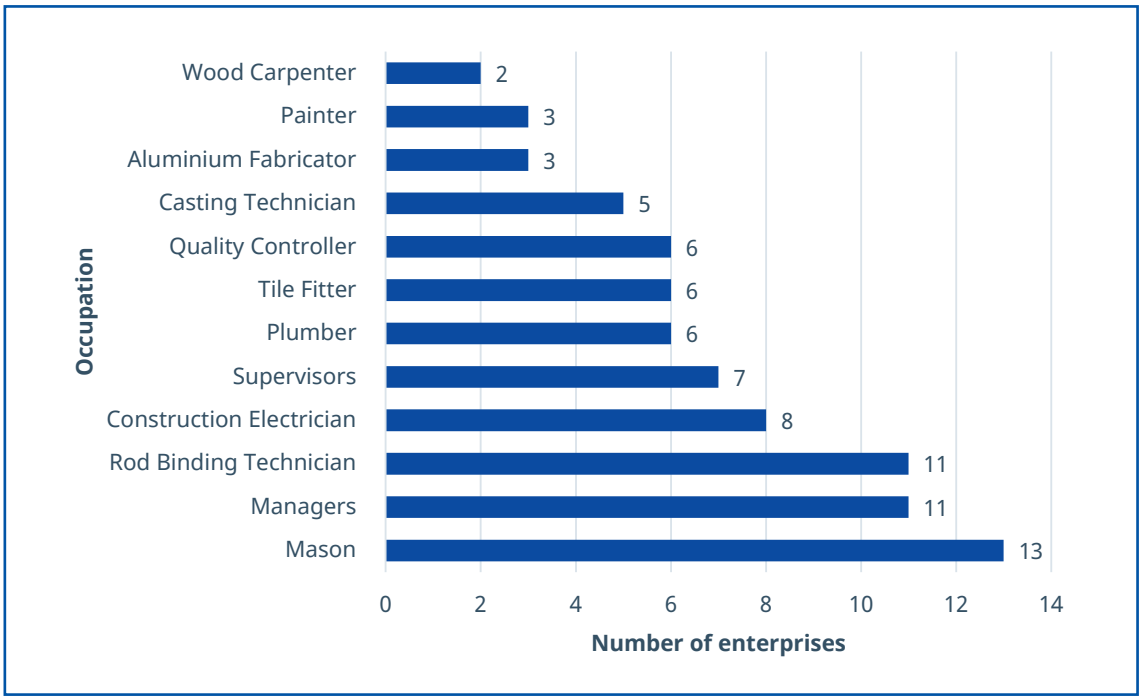
During KII with a business association representative, it was mentioned that the demand for skilled workers within the construction of roads and railways subsector is contingent upon the nature of the construction contracts. Such workers include Civil Engineers, Surveyors, Geotechnical Engineers, Geotechnical Technicians, Structural Engineers, Environmental Engineers and Traffic Engineers – roles focused on the planning, design and sustainability aspects of road and railway construction, and which are typically in steady demand.

In the specialized construction activities subsector, Heavy Equipment Operators, Tile Setters, and Rod Benders are all high priority occupations, indicating a pressing need for workers with these specific skills, possibly due to a shortage of qualified candidates or a surge in construction activities requiring these skills. In addition, Excavator Operators, Crane Forklift Operators, Glaziers and Aluminum Fabricators – specialized technical roles that require extensive knowledge of construction equipment or the possession of specific fabrication and installation skills – all have moderate priority status. Whereas Pile Drivers, Foundation Workers, Carcass Workers, Demolition Workers, Interior Designers, Casting Technicians, Scaffolders and Form Fitters, CAD Designers, and Duct Fitters all demonstrate a normal level of priority, indicating consistent – but not urgent – demand for these roles.

2.2.1. Major occupations and their required skills

As part of the ESS, respondents identified the major occupations in their sector (figure 4). The list of major occupations that came out of the ESS broadly aligns with the list found in table 4 above, but some additional occupations that came up during the FGDs and KIIs were also added to the list in table 4. Masons are the most prominent occupational category, indicated as a major occupation by 13 of the 14 construction sector enterprises surveyed. This substantial share of surveyed enterprises reflects the demand for masonry skills within the sector, and indicating the significant role that construction and related activities plays in the region's economy. Managers and Rod Binding Technicians were the second-most commonly cited occupations, each being indicated by 11 enterprises. This suggests a recognition of the need for balance between managerial roles and specialized technical positions, emphasizing the importance of both leadership and technical expertise within the sector. Construction Electricians and Supervisors were indicated by 8 and 7 enterprises, respectively, signifying the need for skilled professionals in electrical and supervisory roles to support construction and related operations. These roles are crucial for ensuring efficient and safe construction practices. Plumbers, Tile Fitters and Quality Controllers were indicated by 6 enterprises, underlining the consistent demand for skilled tradespeople within the sector. The participants in an FGD discussion in Chattogram district indicated that the construction sector is expanding in Bangladesh, resulting in increasing the demand for skilled workers. As the sector grows, the need for specialized skills such as steel cutting, steel binding mechanics, and machine operation will become more pronounced, according to FGD participants. The FGD participants also mentioned there being new growth in demand for Tile Technicians, which indicates a trend towards specialization within the construction industry, potentially as a response to evolving market needs or as part of a push towards higher quality standards in building finishes.

▶ Figure 4. Major occupations in the construction sector according to surveyed enterprises (no. of respondents, N=14)

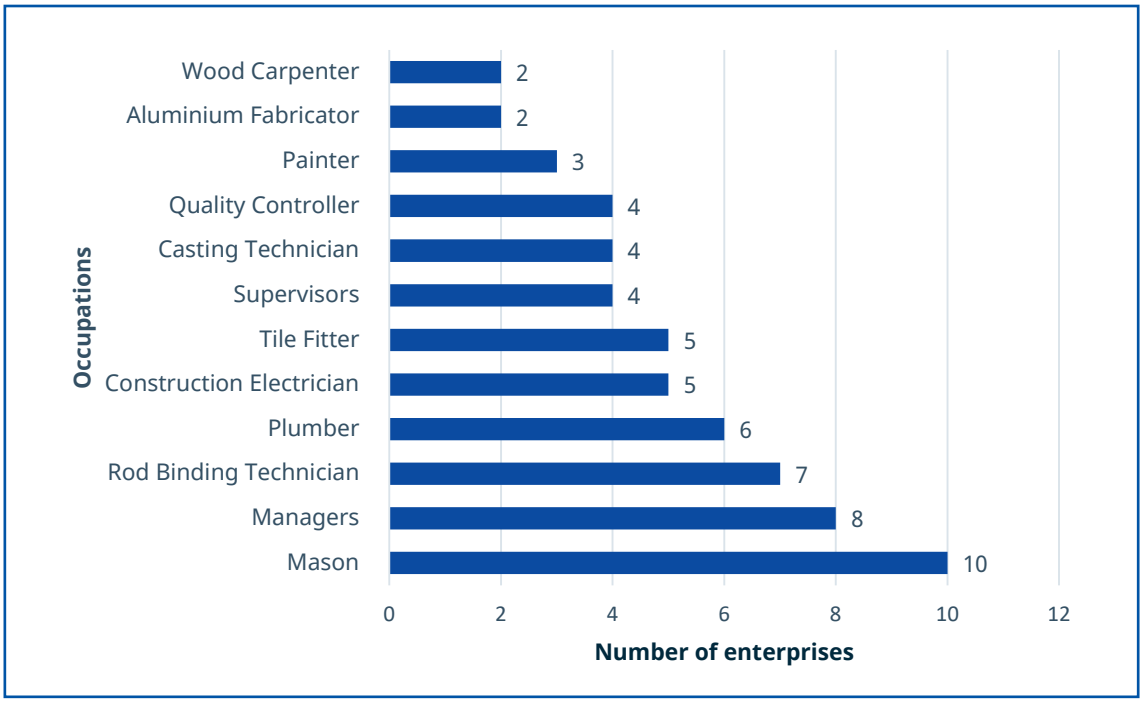


Note: Multiple responses possible. Source: ILO Establishment skills survey, 2023.

2.2.2. Recruitment

Figure 5 sheds light on the demand for specific skills and expertise within the construction sector. Masons rank as the occupation for which it was most likely for there to be job vacancies, with 10 out of the surveyed enterprises saying they had vacant positions for Masons. The need for Masons underscores the robust activity in construction and related fields, as they are essential for tasks such as bricklaying and stone work. Managers came in second, with 8 enterprises reporting vacancies. Managers play a pivotal role in overseeing and coordinating construction activities, ensuring projects are executed efficiently and effectively. Rod Binding Technician and Plumber vacancies were reported by 7 and 6 enterprises, respectively, and 5 enterprises reported vacancies for Title Fitters and Construction Electricians, which highlights the ongoing demand for skilled tradespeople in the construction sector. Supervisors, Casting Technicians, and Quality Controllers vacancies were reported by 4 enterprises. These roles are vital for maintaining quality standards and overseeing various aspects of construction and finishing work.

▶ Figure 5. Vacant positions in surveyed construction enterprises (no. of respondents, N=14)

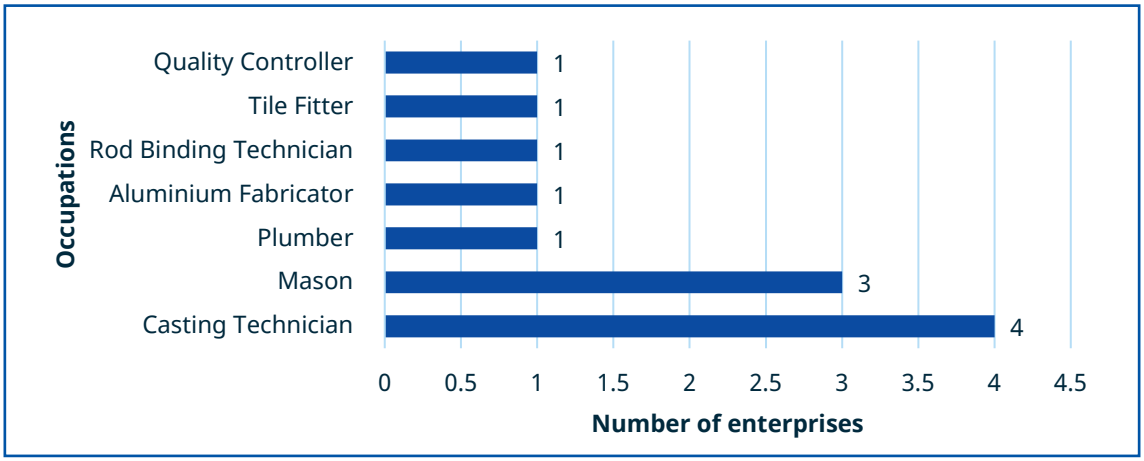


Note: Multiple responses possible. Source: ESS 2023

2.2.3. Hard-to-fill occupations in the construction sector

Overall, there are no occupations in the sector that were classified by a majority of surveyed enterprises as being hard to fill, but Casting Technicians and Mason roles stand out as the most challenging to fill, being indicated by 4 and 3 enterprises, respectively. This suggests a significant shortage of skilled individuals within the construction sector for these particular trades (figure 6). According to an FGD session in Chattogram, the reason that these specific occupations are hard to fill is that the nature of the job demands individuals who have both strength and good health as well as sufficient experience and expertise. Occupations such as plumbers, aluminum fabricators, rod binding technicians, tile fitters, and quality controllers were also all cited by one enterprise each as being hard-to-fill. As an FGD session noted, most of these workers lack formal training and education, and it therefore takes time to gather relevant skills through learning by doing, which can lead to difficulties in filling these roles. This particular challenge was repeatedly mentioned in the STED Workshop as well.

▶ Figure 6. Hard-to-fill occupations in the construction sector according to surveyed enterprises (no. of respondents, N=14)

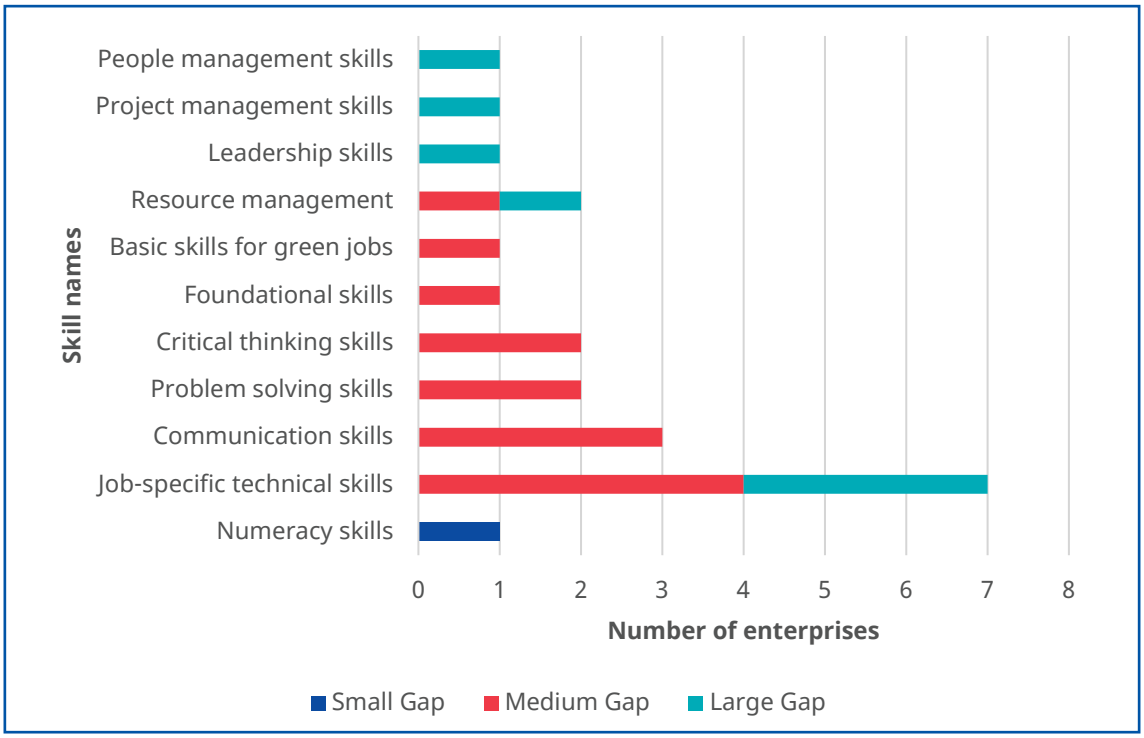


Note: More than one response possible. Source: ESS 2023.

▶ 2.3. Current workforce and skills

The surveyed enterprises were asked to note any skills gaps in the sector based on their experience, and to denote whether these gaps were small, medium or large in nature. Figure 7 below presents the findings, and demonstrate that the most commonly reported skills gap area was in job-specific technical skills, with half of the enterprises citing gaps in this space. Four of these enterprises classified these job-specific technical skills gaps as being medium, and the remainder felt these gaps were large in nature. This finding is in keeping with the vacant positions and hard-to-fill occupations data above, which suggested that occupations involving technical skill and know-how were among the most difficult to fill. During FGD in Rangamati, the participants said that there is an expressed deficiency in specific technical skills, which is attributed to the lack of technical skills training. This lack of technical skills could hinder the quality of work and the ability to adapt to new technologies or advanced construction methods. This could also reflect a mismatch between the skills workers possess and what is required by their jobs. The implications of these results are significant for workforce development, educational programming, and employment strategies as the results indicate where the large gaps are and therefore can be focused accordingly.

▶Figure 7. Skills gaps cited by construction enterprises (no. of respondents, N=14)

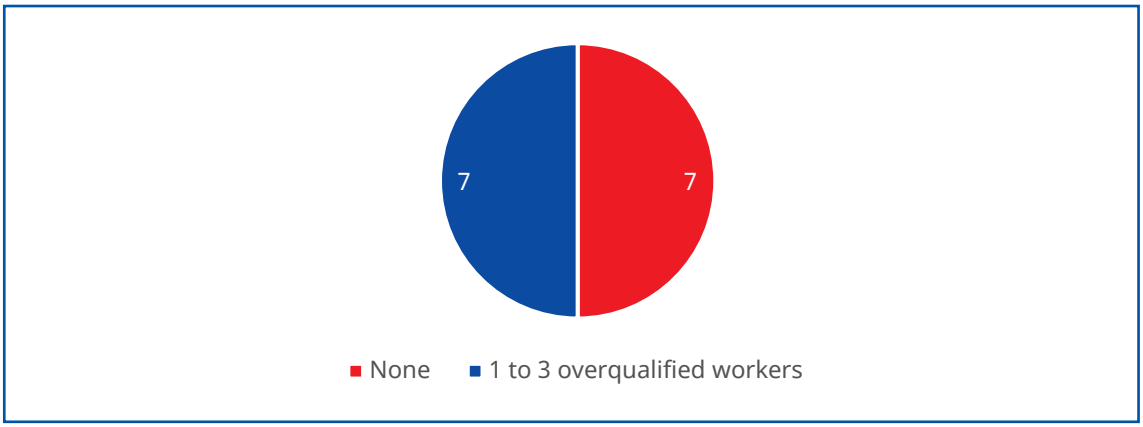


Note: Multiple responses possible. Source: ESS 2023

2.3.1. Underutilization

According to the ESS survey, 7 of the surveyed enterprises indicated that they do not have any workers with qualifications that exceed what is required by their job (figure 8). However, the remaining 7 enterprises indicated that they have between one to three overqualified workers. This suggests that a notable portion of construction enterprises employ at least some workers that are not fully utilizing their education, skills, and qualifications in their current positions. This can lead to frustration among workers and give the impression that the sector does not adequately promote the advancement of workers' careers.

▶ Figure 8. Number of workers in surveyed enterprises with qualifications surpassing their job requirements (no. of respondents, N=14)



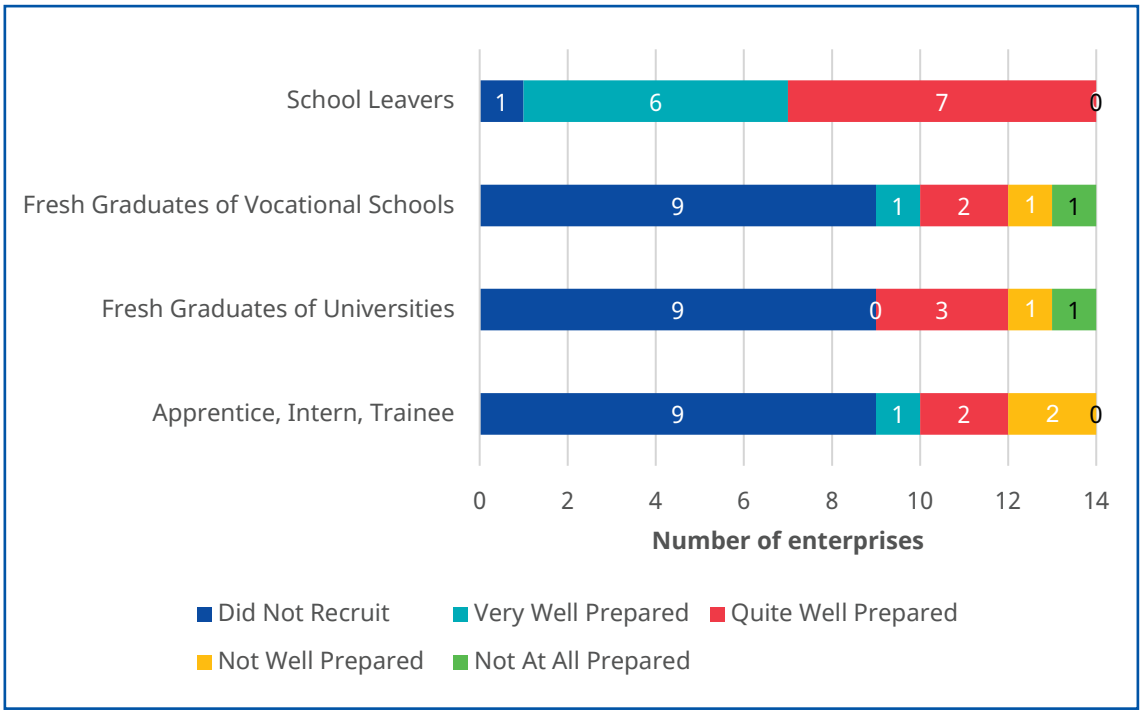
Source: ESS 2023.

2.3.2. New entrants

The surveyed enterprises were asked to judge the preparedness level of various types of new entrants to the construction sector (figure 9). One of the most striking features of the responses is that more than half of the enterprises (n=9) did not recruit individuals who had received sector-specific training (TVET grads and apprentices/trainees) or had a university degree. This may imply that these employers are having trouble luring these kinds of applicants or that there are obstacles in the way of hiring them. However, among those the enterprises that did recruit TVET graduates, university graduates and apprentices/trainees, responses concerning their preparedness were mixed. Just 3 out 5 enterprises indicated that fresh university graduates, apprentices/interns and fresh TVET graduates were either very well prepared or quite well prepared for their first job, the remaining 2 out of 5 saying that these hires were either no well prepared or entirely unprepared. As such, there may be a discrepancy between the qualifications these applicants present and what businesses are looking for.

By contrast, nearly all of the surveyed enterprises (13 out of 14) reported recruiting school leavers, and generally gave them high marks for preparedness. Many jobs within construction – including high-demand roles like Masons and Plumbers – do not require formal qualifications, and instead many learn through on-the-job training. The responses concerning the preparedness of school leavers in figure 9 might therefore not refer to their actual level of preparedness when they first entered the sector, but rather demonstrate enterprises' preference for training their own workers. As such, school leavers are viewed by many enterprises as being better suited to their needs than those who have received formal instruction that does not meet enterprises' needs. A number of FGD and KII participants were very forceful in noting that most workers in the sector are not properly educated, and this is reflected in these survey results.

▶ Figure 9. Preparedness level of new entrants in their first jobs, by type of new entrant (no. of respondents, N=14)

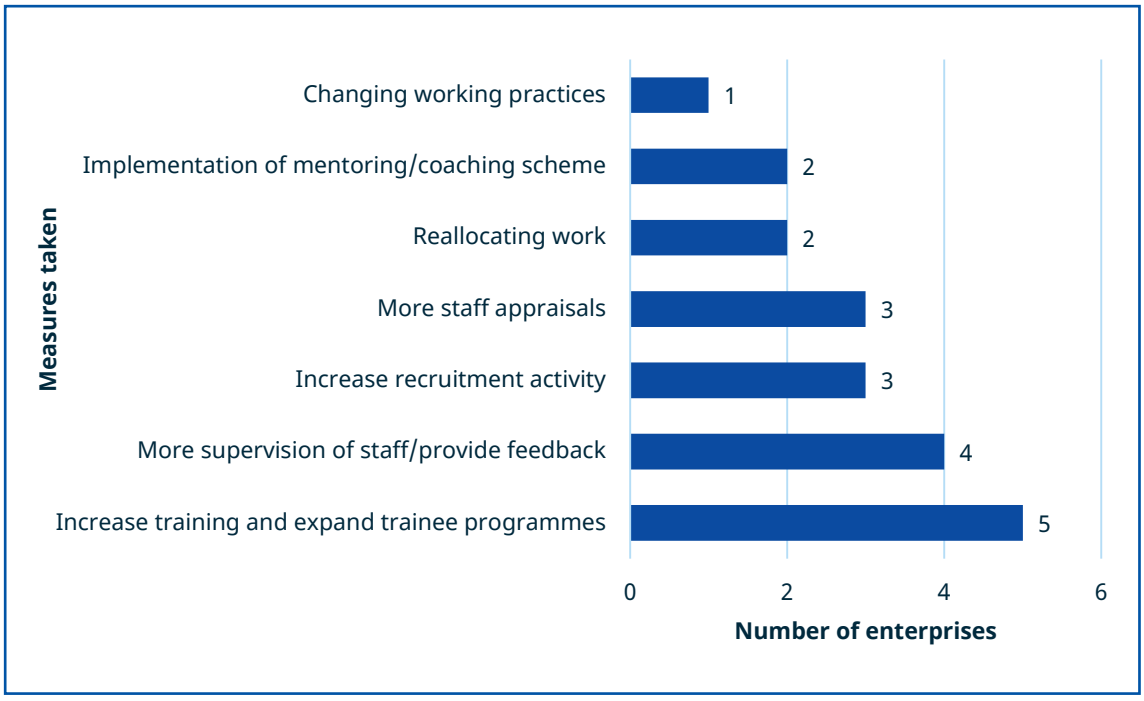


Source: ILO Establishment skills survey, 2023

▶ 2.4. Workforce development

To overcome the fact that some workers are not fully proficient, enterprises reported taking various actions to address these deficiencies (as depicted in figure 10). The most commonly adopted strategy was to increase training and expand trainee programmes, as indicated by five enterprises. This suggests that organizations recognize the importance of investing in training and development to enhance their workforce's capabilities. More supervision of staff or providing feedback to staff was also reported by four enterprises. This highlights the significance of ongoing feedback and guidance in improving proficiency, indicating that regular performance evaluations and supervision play a crucial role in addressing this issue. The options of increasing recruitment activity and more staff appraisals were also adopted by three enterprises, indicating the relevance of hiring additional skilled personnel and conducting regular performance assessments to tackle proficiency challenges.

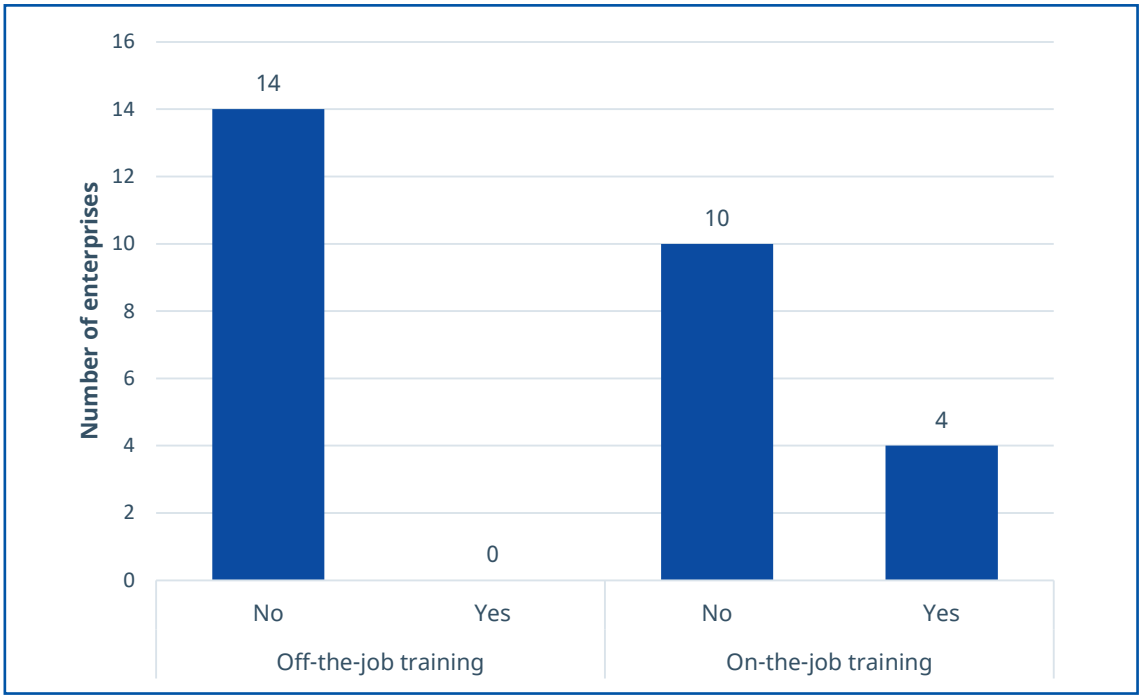
▶ Figure 10. Measures taken by enterprises to overcome challenges related to workers not being fully proficient (no. of respondents, N=14)



Note: Multiple responses possible. Source: ESS 2023.

Despite the fact that number of enterprises cited increased training as a means to address skill deficiencies in their workforce, survey responses show that none of the surveyed enterprises conducted off-the-job training programmes for their employees during the last 12 months (figure 11). This finding further reinforces the idea that there is a tendency among construction enterprises to prefer in-house or on-the-job training methods over external or formal training programmes. However, despite this apparent preference, only 4 of the 14 surveyed enterprises provided such training over the course of the previous year. This demonstrates a general hesitancy among the surveyed construction enterprises to invest in or support training programmes of any kind. This lack of investment in training could be contributing to the skills gaps identified above. During the FGD in Rangamati, participants said that the sector seems to rely heavily on on-the-job learning, which may be effective for practical skills but could leave gaps in comprehensive understanding that could be crucial as construction technology evolves.

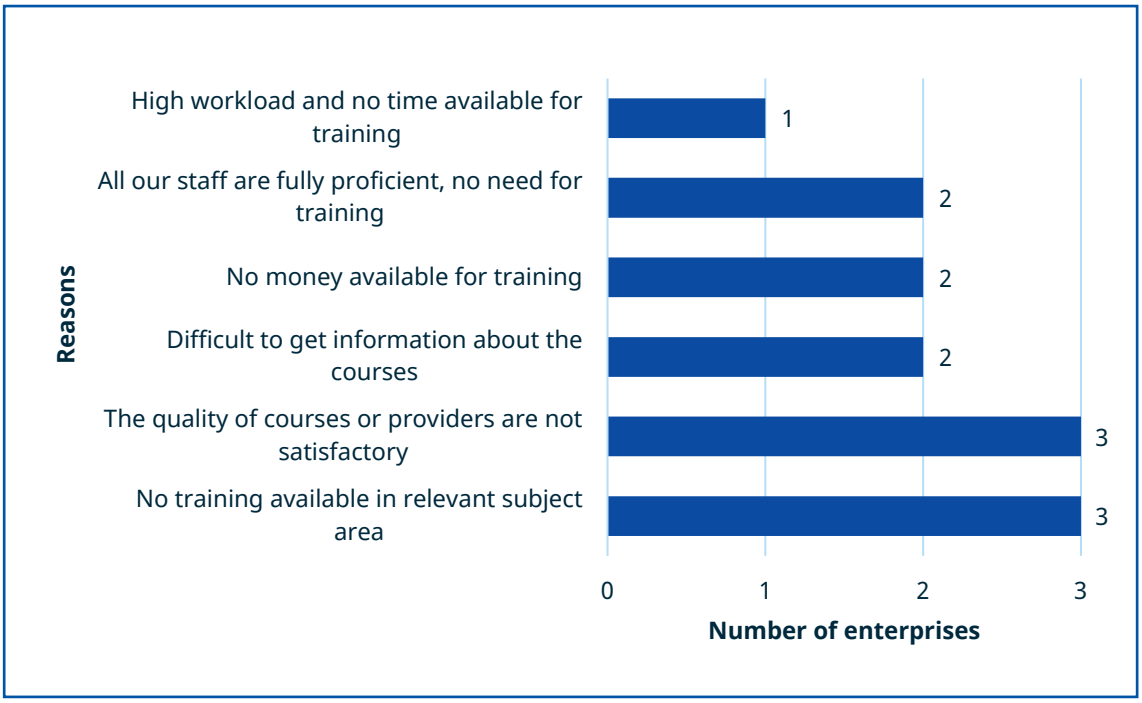
▶Figure 11. Enterprises' support for job training in the last 12 months (no. of respondents, N=14)



Source: ESS 2023.

Figure 12 illustrates the various reasons given by enterprises for not providing or funding education or training for their workers. The results reveal that the unavailability of relevant training and the unsatisfactory quality of available courses are the biggest barriers to enterprises investing in formal training programmes. Lack of financial means and lack of access to information on training course were also each reported by two respondents as reasons for not funding the training. This suggests that along with the scarcity of relevant training, lack of information and financial limitations are significant factors in the decision to not fund or provide training.

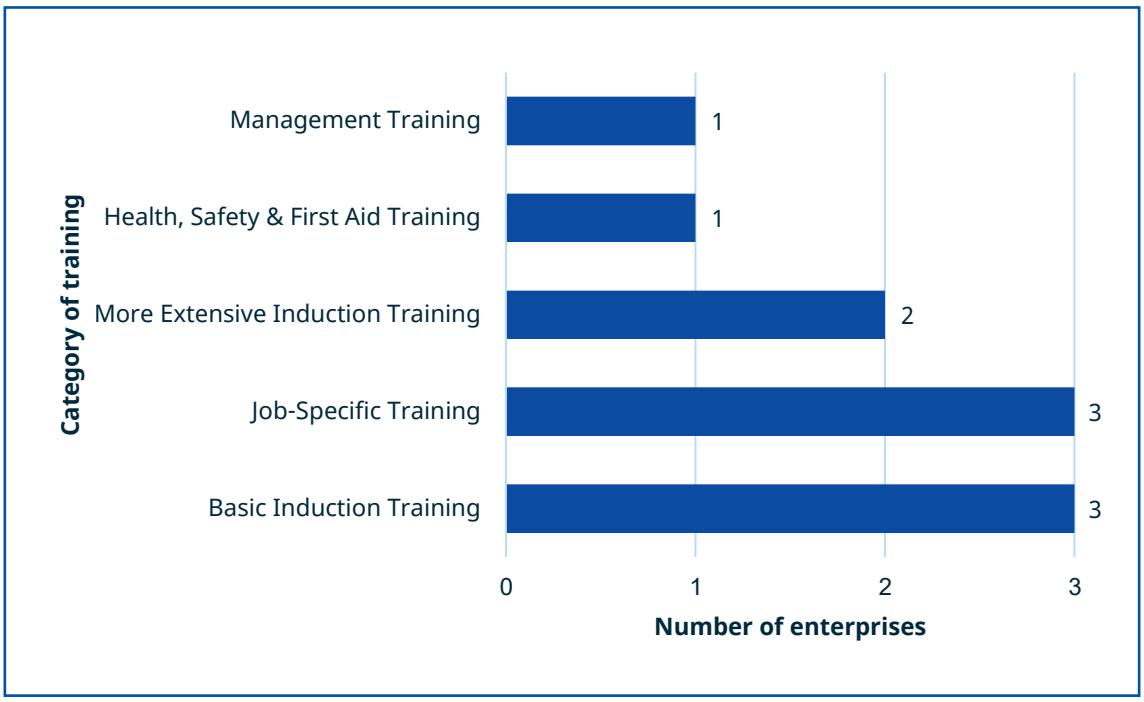
▶ Figure 12. Construction enterprises' reasons for not providing/funding education or training (no. of respondents, N=14)



Note: Multiple responses possible. Source: ESS 2023.

Based on the survey responses, when training is implemented it appears that construction enterprises prioritize induction training (five enterprises) and job-specific training, with each indicated by three enterprises (figure 13). This suggests an emphasis on making sure staff members have a firm grasp of the company's policies and procedures (basic or extensive induction) in addition to receiving job-specific training that is tailored to their particular duties. The preference for induction training for new staff rather than any more extensive skills training might be due to needing to quickly onboard workers hired for contractual jobs, as mentioned by one business owner interviewed in Chattogram: "As we do contractual construction and appoint contractual workers to finish the sites. We don't have the opportunities to give training." According to the FGD participants in Rangamati, there are gaps in current education and practical learning opportunities. Workers are learning from their superiors without going through structured training opportunities, which can lead to inconsistent skill levels and knowledge gaps. This also indicates that induction training and learning from superiors are not sufficient on their own to ensuring that skill gaps are minimized. Rather, institutional attempts to actively minimize skill gaps are essential to capacitate individuals for their jobs.

▶Figure 13. Types of training arranged by construction enterprises (no. of respondents, N=14)

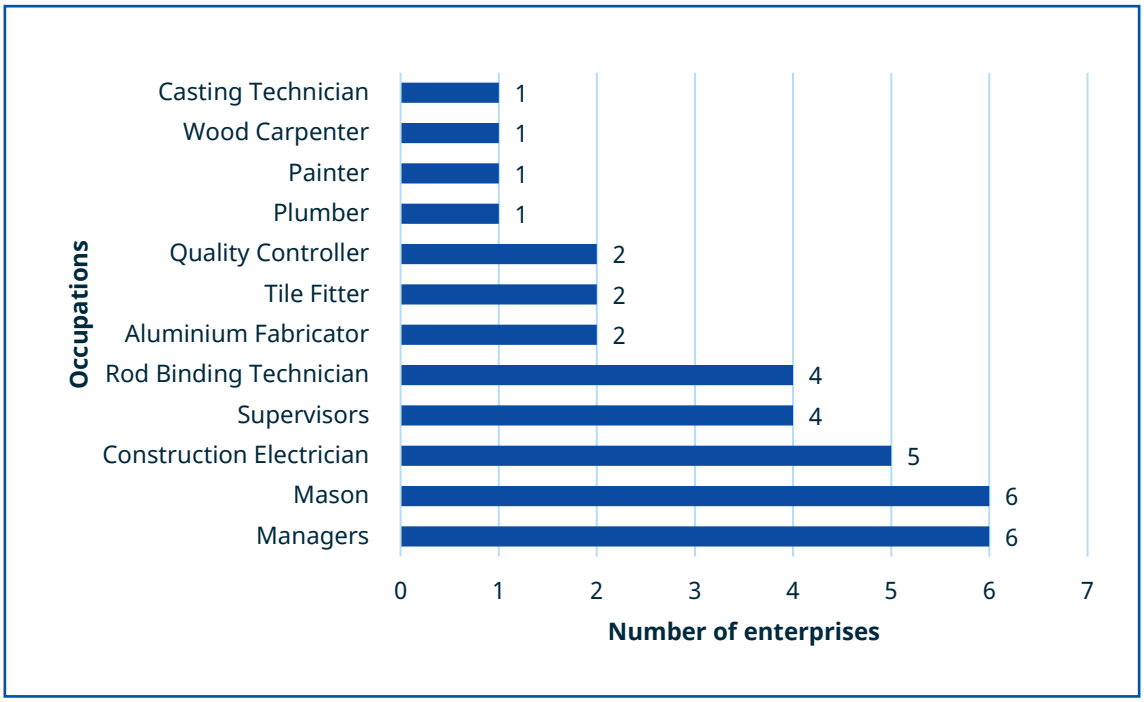


Note: Multiple responses possible. Source: ESS 2023.

▶ 2.5. Future labour and skills demand

The surveyed construction enterprises were asked what occupations they believed would be in demand in the future. The two most commonly supplied answers were Managers and Masons (indicated by 6 enterprises for each). This response suggests that construction sector enterprises see a continuing level of high demand for these roles in the future, as both were already the two most commonly cited major occupations and vacancies in the sector at present (see figures 4 and 5 above). This indicates the critical role of experienced professionals who can manage and oversee construction projects efficiently, as well as the vital role that skilled brickwork and stonework plays within the sector. Enterprises also anticipated that skilled trades such as Construction Electricians (five responses), Supervisors (four responses) and Rod Binding Technicians (four responses) would also continue to be in great demand in the future. These responses highlight the ongoing demand for specialist talents in the building and maintenance of infrastructure. Furthermore, the data also indicate the value of finishing and detailing labour, as shown by the two responses for occupations such as Aluminum Fabricator, Tile Fitter and Quality Controller.

▶ Figure 14. Occupations that will be in demand in the future, according to construction enterprises (no. of respondents, N=14)



Note: Multiple responses possible. Source: ESS 2023.

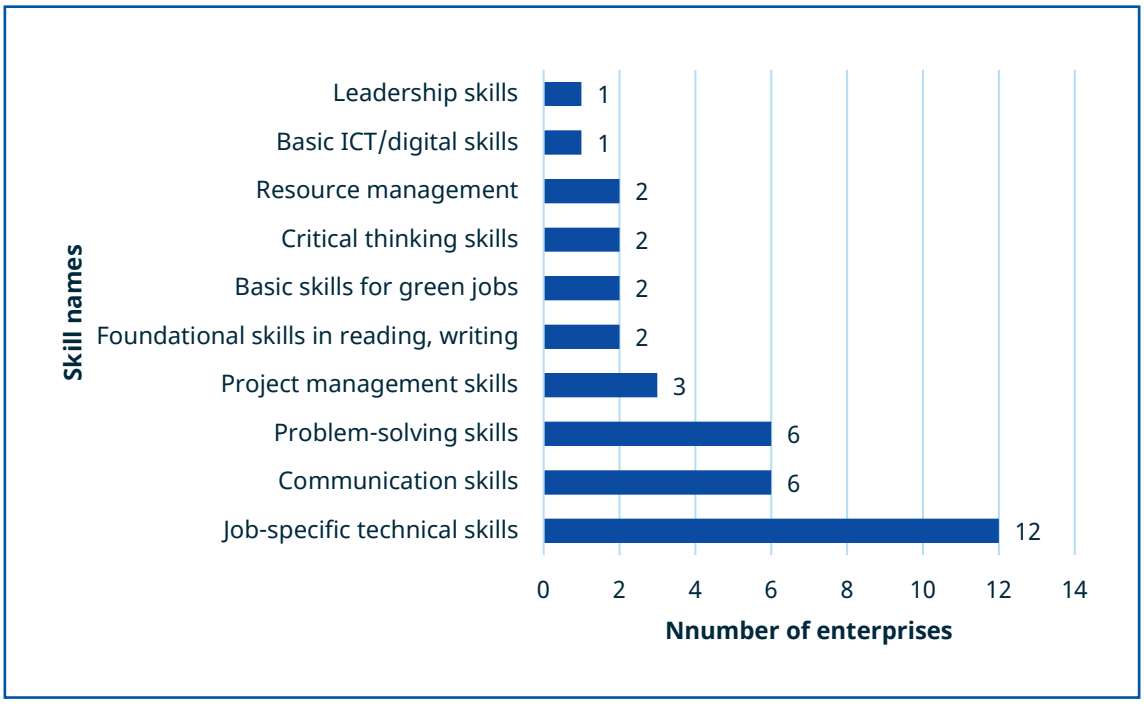
The surveyed construction enterprises were asked to name the skills that they consider important when recruiting workers. Based on the responses provided, construction sector employers clearly rank job-specific technical skills as the most important for recruitment, as this was indicated by 11 of the 14 surveyed enterprises, which was more than double the second-most common answers, emphasizing the sector's need for specialized knowledge (figure 15). Communication, leadership, and project management skills are also valued, each indicated by five enterprises. These skills are crucial for team coordination and project execution. FGD participants in Rangamati also highlighted the importance of soft skills such as communication, teamwork, and problem-solving for client interaction and site efficiency.

▶ Figure 15. Skills that construction sector enterprises consider important when recruiting workers (no. of respondents, N=14)

Note: Multiple responses possible. Source: ESS 2023.

Having already related the skills they currently focus on when recruiting workers, the surveyed enterprises were then asked what kinds of skills they believe will be particularly in demand in the future. Job-specific technical skills once again was the top answer by a wide margin, with 12 enterprises providing this response (figure 16). This indicates that job-specific skills such as tile fitting, aluminium fabrication, floor laying, roofing, equipment operating, plumbing, painting and similar will be in high demand in the future. Communication skills was once again one of the second-most commonly supplied answers (six enterprises), this time joined by problem-solving skills, which were not rated as highly when it comes to what enterprises currently look for during recruitment, suggesting that enterprises view this skill as one that will be increasingly important in the future. Project management skills can also be highlighted, as it gets fairly high number of responses (three), indicating the significance of efficient project planning and execution skills in construction sectors.

▶ Figure 16. Skills that will be in demand in the future, according to construction enterprises (no. of respondents, N=14)



Note: Multiple responses possible. Source: ESS 2023.

▶ 2.6. Vision for the future of the sector

Through the STED Workshop, the construction sector stakeholders crafted a vision statement for the future of the sector. This participatory process involved gathering insights from industry experts, business enterprises, skills development authorities (such as the BTEB), and TVET providers.

The development of the construction sector is pivotal for achieving multiple national goals. To ensure graduation from least developed country status by 2026, to meet Sustainable Development Goal (SDG) targets by 2030, and to align with Bangladesh's Vision 2041 and 8th Five Year Plan, it is essential that the construction sector a focus on both domestic and international markets.

In the domestic arena, growth is imperative to address burgeoning infrastructural demands while reducing reliance on foreign entities. Simultaneously, in the international market, the strategy includes enhancing overseas employment of skilled workers, diversifying export products such as steel and cement, and aligning with environmental standards to secure government incentives and foreign direct investment (FDI). Human resource development plays a critical role by: increasing the number of skilled workers, including university graduates and TVET graduates; fostering local sustainability; and reducing brain drain. Embracing newer technologies is also crucial for efficiency, but a prerequisite in this space is skill development, which is needed to handle modern equipment effectively.

Moreover, a concerted effort in skills development, based on regional and international industry demands, must aim to create an acceptable pool of TVET graduates, thereby ensuring the construction sector becomes a driving force behind economic growth while fulfilling national aspirations.

Draft Vision Statement (Construction Sector): As identified by the stakeholders:

- **Policy:** Development of the construction sector is essential to achieve broader national targets, such as **least developed country graduation in 2026; SDG achievement by 2030; and the achievement of Vision 2041, the 8th Five Year Plan (2021–2025), the establishment of 100 EPZs** across the country, and so on.
- **Domestic market:** Aiming to grow the national market to address the **huge levels upcoming infrastructural development demand and to minimize dependence on foreign agencies.**
- **International market:** Aiming to improve in following areas:
    - Increasing overseas employment of skilled Bangladeshi labour, instead of unskilled labour, in order to enhance the capacity for remittance generation.
    - Increasing and diversifying the **export product basket** to include items such as **steel products, cement, bricks,** and so on.
- **Environmental:** Aiming to gradually improve compliance to harness **incentives from government** and to **attract FDI.**
- **Human resource development:** Aiming to **increase the number of skilled workers,** such as university graduates (engineers) and TVET graduates, to ensure a **locally sustainable employment sector.** Also, envisioning the retention of tertiary graduate human resources and **reducing brain drain.**
- **Technology:** Keen to adopt newer technologies to improve the quality and efficiency of construction work. But before adoption, skills development on **using and handling modern technologies/equipment** needs to be ensured.
- **Skills development:** Planning to create skilled resource pools based on **regional, national and international industry demand. Acceptance of TVET graduates** for employment needs to become the norm at the industry level.

▶ 2.7. Gaps in the capabilities and skills needed to achieve the vision for the future

Stakeholders identified the key business capability gaps by analysing their limitations in sustainably doing business and expanding their business efficiently. This process of gap identification was crucial for realizing the skills implications that needs to be addressed in order to minimize business capability gaps.

▶Table 5. Skills needed to address major business capability gaps in the construction sector

Major business capability gap	Skills needed to address gaps	Relevant occupations
Developing local supplier base	▶ Skills on networking ▶ Skills on negotiation and bargaining	▶ Managers ▶ Supervisors
Product improvement / product innovation	▶ Skills on architectural design and interior design using modern tools and techniques ▶ Skills on 3D modeling ▶ Skills on geotechnical engineering	▶ Interior Designers ▶ Architects ▶ Geotechnical Engineers
Quality assurance and quality control	▶ Knowledge on quality standards and compliance requirements ▶ Skills on compliance and standards maintenance ▶ Skills on monitoring ▶ Skills on project budgeting	▶ Quality Controllers ▶ Managers ▶ Supervisors ▶ Designers
Legal frame, transparency, accountability	▶ Knowledge of construction policies, zoning guidelines, legal documents requirements for infrastructure development ▶ Skills on record keeping and progress tracking	▶ Managers ▶ Supervisors ▶ Architectural Designers ▶ Civil Engineers
Human resources management	▶ Knowledge on the National Qualifications Framework to recruit formally certified graduates ▶ Core skills such as team management, leadership, communication for managers ▶ Technical skills: electrical works, masonry, carpentry, foundation, plumbing, insulation, crane operation, excavator operation, tile setting, welding, and so on.	▶ Managers ▶ Supervisors
Energy efficiency and waste management	▶ Skills on waste handling and management (scrap, plastics, chemicals, mild steel, and so on)	▶ Managers ▶ Supervisors
Export business and business sales, marketing, relationship management	▶ Skills on marketing ▶ Skills on communication ▶ Skills on negotiations and bargaining ▶ Skills on market linkage	▶ Managers ▶ Supervisors
Social and community engagement	▶ Skills on Communication ▶ Skills on conflict management	▶ Managers ▶ Supervisors
Regulatory compliance for domestic and export markets	▶ Skills on implementing environmental compliance maintenance (emission reduction, waste management etc.)	▶ Managers ▶ Supervisors ▶ Architectural Designers ▶ Civil Engineers

1. Developing a local supplier base

- **Skills on networking:** Proficient networking skills enable individuals to establish and maintain relationships with potential local suppliers. This fosters collaboration and facilitates the growth of a reliable and diverse supplier network.
- **Skills on negotiation and bargaining:** These skills are essential for securing favourable terms and conditions with local suppliers, contributing to cost-effectiveness and sustainable partnerships.

2. Product improvement/innovation

- **Skills on architectural design and interior design using modern tools:** Proficiency in design tools such as CAD (computer-aided design) and BIM (building information modeling) enhances the ability to innovate and improve product offerings.
- **Skills on 3D modeling:** 3D modeling skills aid in visualizing and refining product concepts, leading to enhanced design precision and innovation.
- **Skills on geotechnical engineering:** Understanding geotechnical aspects is crucial for efficiently assessing the geographical, morphological and climatic components, allowing one to be aware of the current conditions and risk potential before designing a construction project.

3. Quality assurance and quality control

- **Knowledge on quality standards and compliance requirements:** Understanding and applying quality standards for the construction sector ensures that products meet or exceed customer expectations and comply with industry regulations, such as building codes, zoning policies and so on.
- **Skills on monitoring:** Effective monitoring skills help identify and rectify infrastructure quality issues promptly, preventing costly errors.
- **Skills on project budgeting:** Budgeting skills are vital for calculating capital investment, working capital, wages, material procurement, budget forecasting, and so on.

4. Legal framework, transparency and accountability

- **Knowledge on construction policies, zoning guidelines and legal documents:** In-depth knowledge of legal frameworks and documentation requirements ensures transparency and compliance with regulations.
- **Skills on record keeping and progress tracking:** These skills support accountability by maintaining transparent records and tracking project progress against legal and regulatory benchmarks.

5. Human resources management

- **Knowledge on the Bangladesh National Qualifications Framework:** Understanding the Framework aids in recruiting formally certified graduates, ensuring a qualified workforce.
- **Core skills for managers:** Leadership, team management and effective communication skills are crucial for managing diverse teams and fostering a positive work environment.
- **Technical skills:** Specific technical skills are essential for assessing and recruiting skilled labour, aligning workforce capabilities with project requirements. Electrical works, masonry, carpentry, foundation, plumbing, insulation, crane operation, excavator operation, tile setting, welding, and such other skills have already been mostly identified as priority skills for further development.

6. Energy efficiency and waste management:

- **Skills on waste handling and management:** Proficiency in waste management reduces environmental impact, demonstrating a commitment to sustainability in construction practices.

7. Export business to business sales, marketing, relationship management:

- **Skills on marketing:** Marketing skills help in promoting products to potential business partners, expanding market reach.
- **Skills on communication and negotiation:** Effective communication and negotiation skills are vital for building strong business-to-business relationships and securing favourable deals.
- **Skills on market linkages:** The ability to link products to market demand is crucial for successful business-to-business sales.

8. Social and community engagement

- **Skills on communication:** Effective communication skills enable constructive engagement with communities, fostering positive relationships.
- **Skills on conflict management:** Conflict management skills help address community concerns, ensuring projects proceed smoothly.

9. Regulatory compliance for the domestic and export markets

- **Skills on implementing environmental compliance maintenance:** Skills in implementing and maintaining environmental compliance measures are crucial for meeting regulatory requirements and enhancing sustainability.

▶ 2.8. Skills supply findings

2.8.1. Supply of skills

According to the BTEB, there are 30 trades/specializations listed under the NTVQF, but training programmes related to all of these trades/specializations are not available in every region. The evaluation of the supply side indicates that the majority of construction sector-related courses are accessible in the Chattogram district; however, their availability is notably limited in the districts of the Chattogram Hill Tracts (Bandarban, Khagrachari, and Rangamati) as well as in Cox's Bazar. While table 5 below depicts the availability of most courses in the Chattogram region, it is crucial to note that this is primarily attributed to the Chattogram district. The following table illustrates the availability of several courses in the Chattogram–Cox's Bazar region. The analysis has been done for five levels of courses, with four of these being formal courses, namely: Diploma, HSC (Voc), SSC (Voc), and National Skill Certificate (Levels 1–5) courses[4] . In addition, informal courses were found to be dominant in the catchment areas, which cover need-based training without following the NTVQF directly.

4 Formal courses refer to those with certification based on the NTVQF.

▶ Table 6. Available construction sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level

Programme level	Trade/specialization programmes available	
	Chattogram region	Cox's Bazar
Diploma	Architecture Technology Civil Technology Construction Technology Electrical Technology Environmental Technology	Architecture Technology Civil Technology Electrical Technology
HSC (Voc)	Building Construction and Maintenance Electrical Works and Maintenance	Automotive
SSC (Voc)	Building Maintenance Civil Construction Electrical Maintenance Electrical Maintenance Work General Electrical Works Welding and Fabrication	Building Maintenance Civil Construction Electrical Maintenance Work General Electrical Works
NSC (Levels 1–5)	Architecture Technology Electrical House Wiring Electrical Installation and Maintenance General Electrical Mechanics Masonry Plumbing and Pipe Fittings Welding	Architecture Drafting Electrical House Wiring General Electrical Mechanics Masonry Plumbing Tiles Fittings Welding
Informal certificate courses	Carpentering Civil Technology Electrical House Wiring Electrical Installation and Maintenance Electrical Technology Electrical Works Electrical Works and Maintenance Forklift Operations and Maintenance Plumbing Plumbing and Pipe Fittings Tiles Fittings Welding	Block Building Electrical Technology Masonry Plumbing Rod Bending Tiles Fittings Welding

Note: The trades/specializations listed in this table are as per to the NTVQF.

2.8.2. Typical career pathways within the sector

For the construction sector, the career pathways differ slightly from programme to programme. For example, diploma graduates usually start their careers as a foreman and move ahead in their career journey from there. SSC (Voc) graduates, by contrast, generally have a chance to either enroll in another TVET programme or to move into the industry, albeit at a lower level on the career ladder.

▶ Table 7. Typical career pathways in the construction sector, by TVET programme certification level

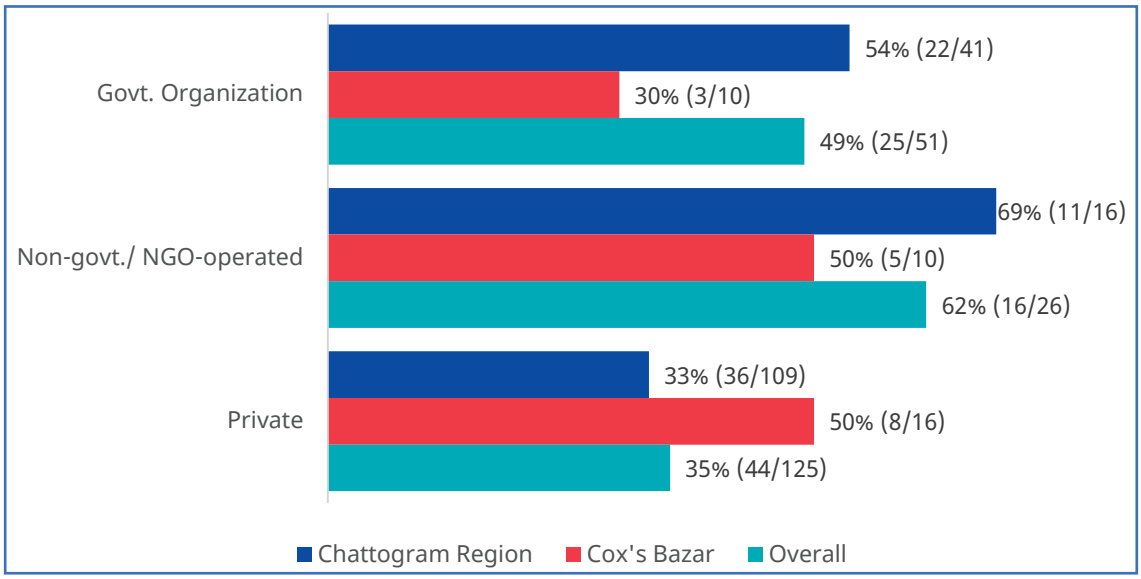
Programme level	Typical career pathway
Diploma	Graduates usually start their careers in a managerial role, such as a probationary engineers/supervisor, and move ahead in their career pathways. Some graduates also shifted abroad to work as skilled workers after gathering in-hand experience and sector-based exposure.
HSC (Voc)	The HSC (Voc) serves as an exemption for the length of diploma courses when enrolling. If graduates do not engage further in training/education, they might enter the industry as a worker through any local level intermediary and start their career.
SSC (Voc)	Graduates interested in further education have multiple opportunities, such as enrolling into an HSC (Voc) programme or jumping into a diploma. Individuals not pursuing further education shift into the industry through persuading local labour intermediaries to take them on as workers. Through gaining experience they move up the ladder depending on the passion they possess and the skills they have gained.
NSC	NSC levels 1 and 2 graduates usually enter sector-based industries as a worker based on their certification. They seek the help of instructors' references and programme linkages to enter the industry. Moreover, graduates from level 4 sometimes join as instructors or trainers in the TVET providers. In addition, some become self-employed through performing contract work for local households, markets and construction sites.
Informal certificate	Graduates from informal certificate courses tend to start working under an informal entrepreneur through their instructor's linkages. However, they usually cannot enter sector-specific industries due to the absence of formally accredited certification.

As can be seen in table 6, graduates from NSC level 4 have better construction sector career pathways than those with lower NSC level certification. Conversely, graduates from informal courses often have non-industry-specific career pathways. Both of these outcomes are due to the accreditation status – or lack thereof – of their certificates.

2.8.3. Types of TVET providers

TVET providers offering courses related to the construction sector can be divided into three types based on their owner/operator: (i) government-operated; (ii) NGO-operated; and (iii) privately owned. However, the distribution of courses being offered by these different providers varies across the region, with construction-related courses more commonly on offer in the Chattogram region compared to Cox's Bazar. Moreover, construction-related courses are most commonly offered by NGO-operated providers, with this being the case for 62 per cent of all NGO-operated TVET providers in the region; followed by government providers at 49 per cent, and private sector providers at 35 per cent.

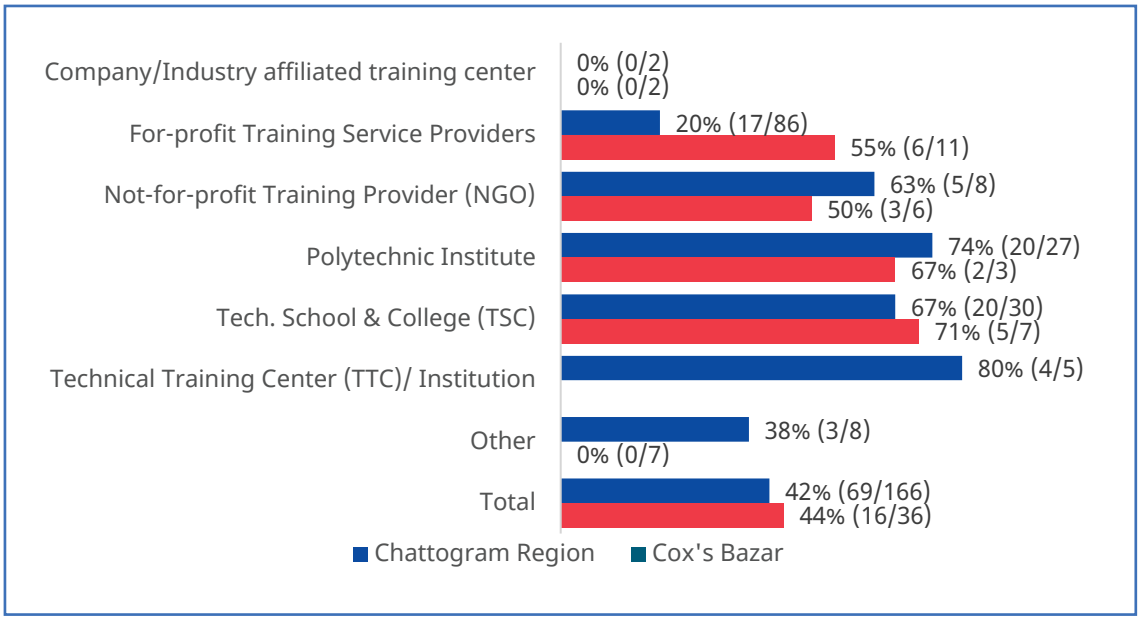
▶ Figure 17. Prevalence of construction-related courses in surveyed TVET providers, by owner/operator of the provider



Source: Survey of TVET providers.

Drawing on responses from different types of TVET providers, not-for-profit providers in the Chattogram region (5 out of 8) were slightly more likely to offer construction-related courses than those in Cox's Bazar (3 out of 6). However, the opposite scenario is observed in for-profit TVET providers, as they were more likely to offer construction-related courses in Cox's Bazar (55 per cent) than in Chattogram (20 per cent). Almost all of the Technical Training Centers (TTCs) (80 per cent) in the Chattogram region offer construction courses. However, there is no TTC in Cox's Bazar, and hence no course offerings. The lack of a TTCs and training providers are due to the fact that growing demand for skilled construction workers is being addressed by for-profit and not-for-profit establishments in Cox's Bazar.

▶Figure 18. Prevalence of construction-related courses in different types of TVET providers (%)

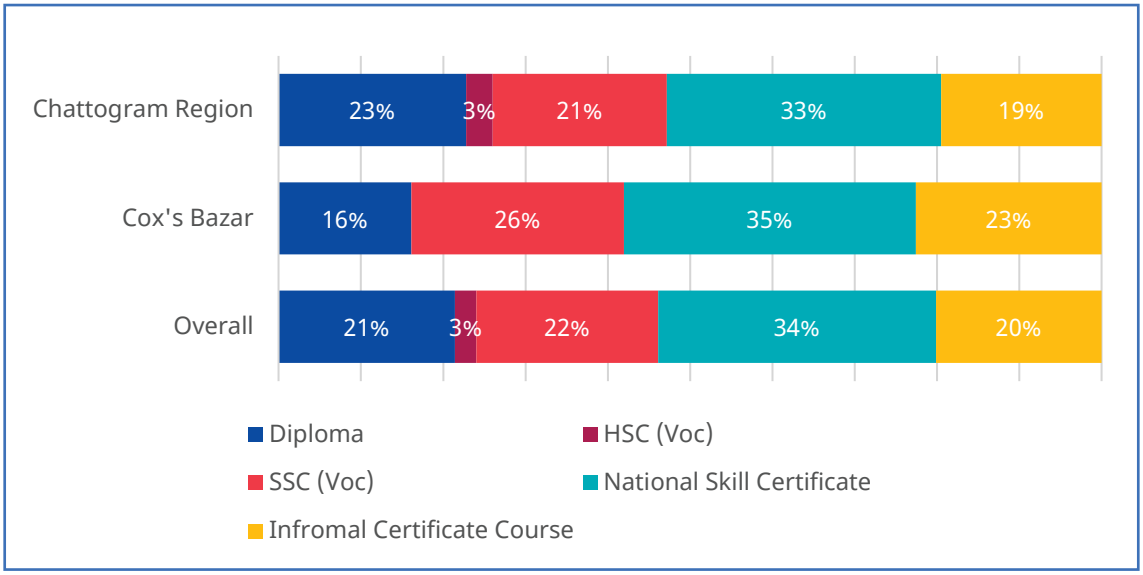


Source: Survey of TVET providers.

2.8.3. Formal programmes for the construction sector

Among the formal construction-related TVET programmes on offer in the Chattogram–Cox's Bazaar region, the study team observed that National Skill Certificate (NSC) courses aligned with the NTVQF accounted for the largest overall proportion in the region (34 per cent) and the largest proportions in both Chattogram (33 per cent) and Cox's Bazaar (35 per cent). The second-most common course in the construction sector are SSC vocational courses, comprising 22 per cent, with the availability of diploma courses closely following at 21 per cent, demonstrating their comparable prevalence.

▶Figure 19. Level of the construction-related skills programmes available (%)



Source: Survey of TVET providers.

The study also reveals that informal courses are also quite common, with approximately 20 per cent of construction courses providing learners with the TVET providers' own self-certification. As stated above, NCS courses were the most common in both Chattogram region and Cox's Bazar, but notably, in the Chattogram region, diploma courses are the second-most common, accounting for 23 per cent of all construction-related courses. Conversely, in Cox's Bazar, informal courses are the second-most common type of course, at 23 per cent, and there is a total absence of HSC (Voc) offerings. These subregional disparities highlights the diverse approaches to construction training, emphasizing the need for tailored strategies in different areas.

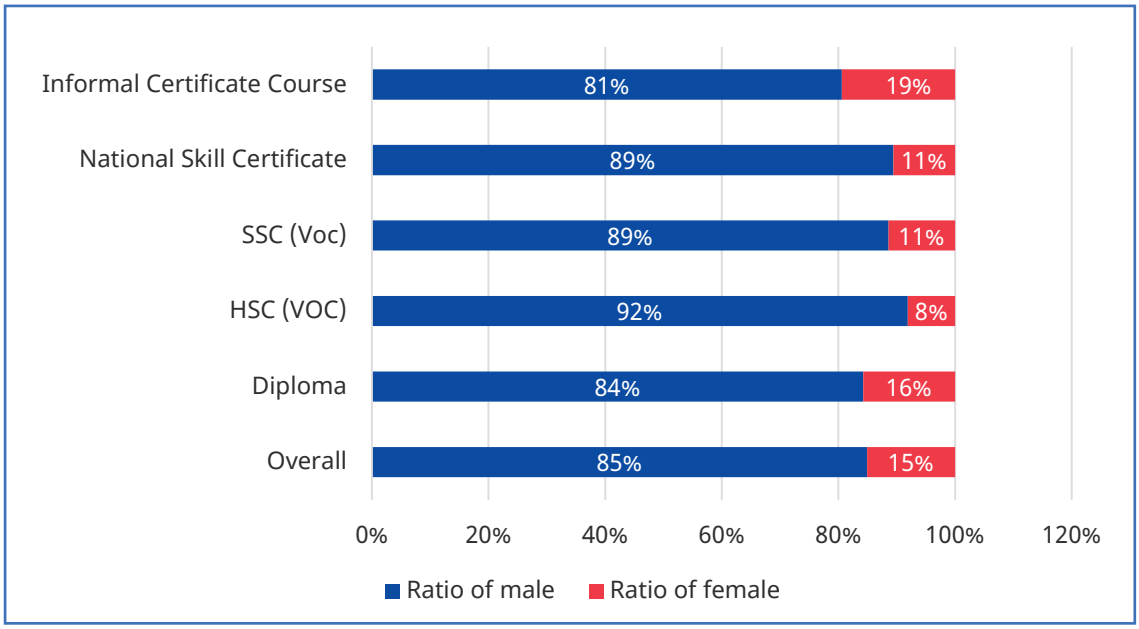
2.8.4. Qualifications relevant to the sector

For any entry-level managerial position in the construction sector, one may have to qualify for a diploma certificate under the NTVQF framework. A supervisor position at a construction site may require HSC (Voc)/SSC (Voc) certification. NSC-level graduates have the chance to enter the sector as a construction worker in a specific role such as welder, tile fitter, and so on. On the other hand, graduates from informal courses might earn the chance to enter the sector as a basic worker, and essentially start their career progression from scratch. However, graduates from general streams of education such as bachelor's and master's degree holders can acquire better positions with a better salary structure compared to those of TVET certificate holders.

2.8.5. Enrollment status by sex

Enrollment in construction-related programmes in the Chattogram region is dominated by male trainees, who account for 85 per cent of all students. Moreover, the proportion of male trainees is even greater in HSC (Voc) programmes (92 per cent) as well as in NSC and SSC (Voc) programmes (89 per cent each).

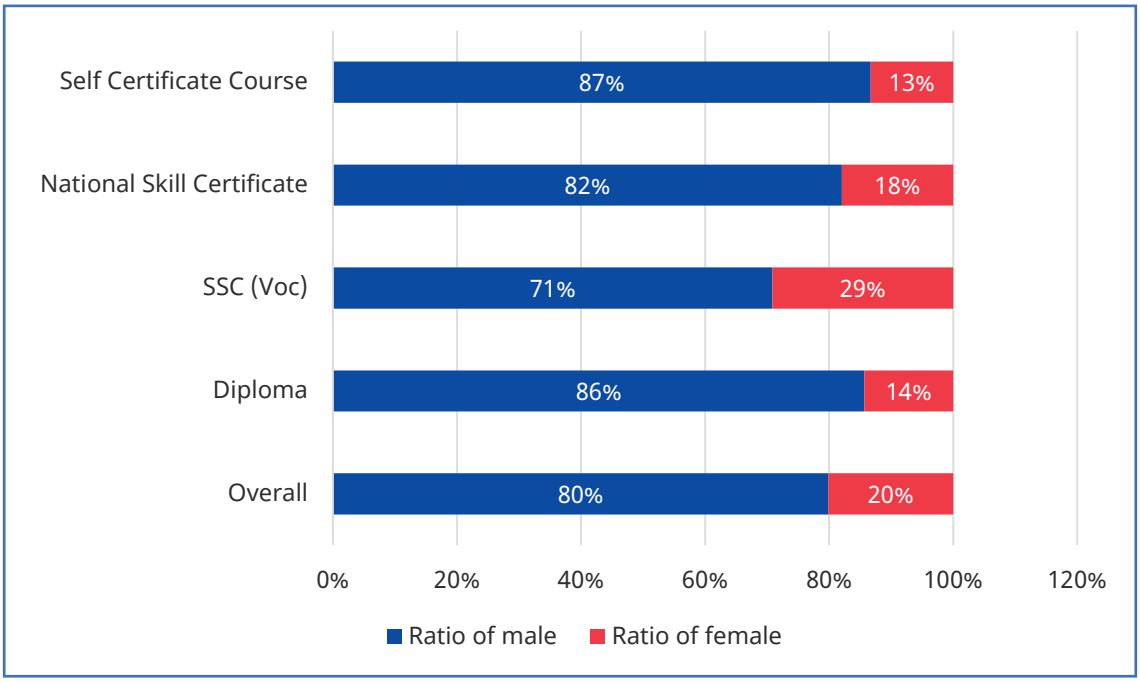
▶ Figure 20. Ratio of male and female trainees enrolled in construction-related programmes in the Chattogram region, by training programme level (%)



Source: Survey of TVET providers.

This enrolment pattern is due to lower demand in the construction sector for female workers, especially in the Chattogram Hill Tracts area. Female workers instead tend to enter traditionally accepted employment activities, such as handicrafts or anything related to household-based income sources such as tailoring, freelancing, and so on. This was also reflected in conversations with graduates and current trainees, who shared the same views. However, in the Cox's Bazar area, female enrollment in construction-related courses is slightly higher than what is seen in the Chattogram region – 20 per cent versus Chattogram's 15 per cent. Moreover, females enrolment is particular pronounced in SSC (Voc) courses (29 per cent), compared to diploma (14 per cent) and NSC (18 per cent) courses.

▶ Figure 21. Ratio of male and female trainees enrolled in construction-related programmes in Cox's Bazar, by training programme level (%)

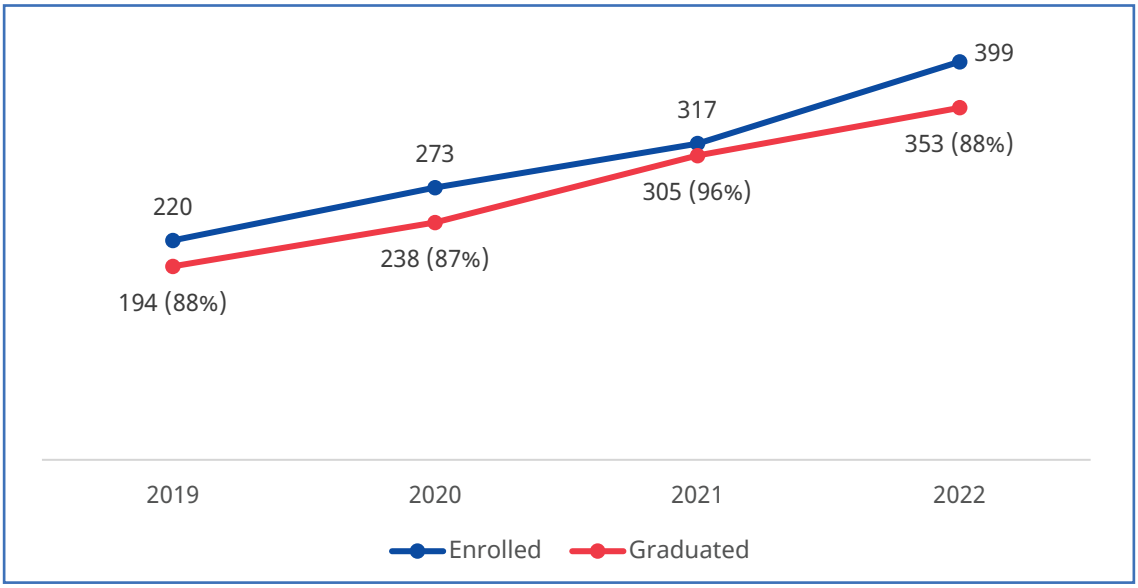


Source: Survey of TVET providers.

2.8.6. Number of graduates

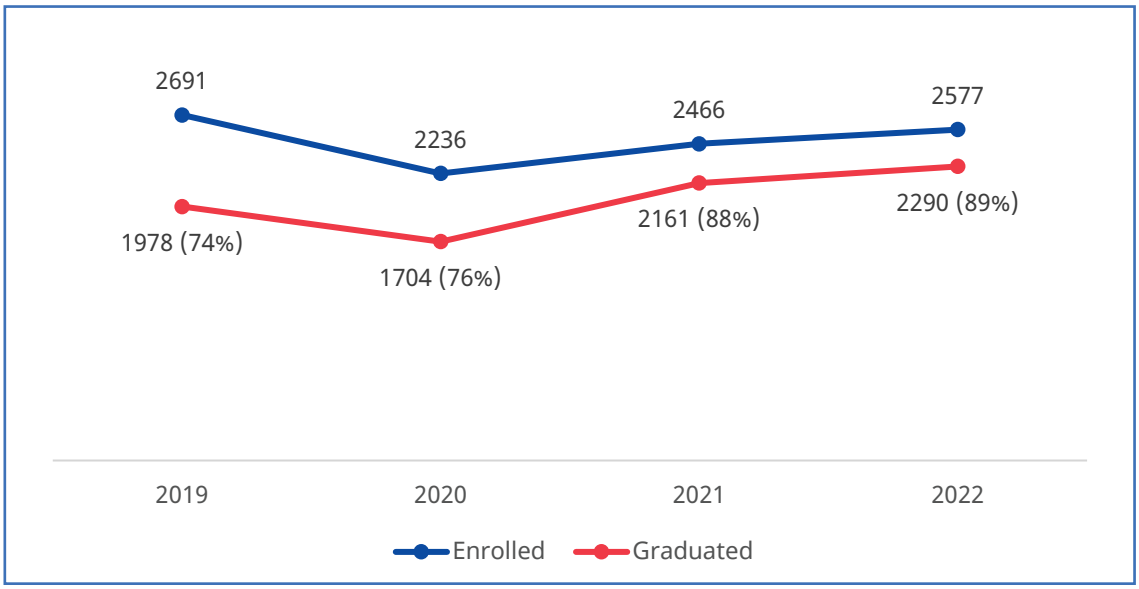
The number of trainees graduating from construction-related courses has rapidly increased in Cox's Bazar, with graduate numbers nearly doubling over a four-year period. The Chattogram region has also been showing an increasing trend, but with much more modest growth in graduate numbers. In 2019, there were 194 construction programme graduates in Cox's Bazaar, with this number growing to 353 in 2022. Notably, numbers did not drop during the COVID-19 pandemic. In Chattogram region, there were 1,978 graduate in 2019, which grew to 2,290 in 2022. However, in 2020, there was a slight drop in the number of graduating trainees. This drop was due to the advent of COVID-19 according to one of the TVET providers consulted. However, it should be noted that sector-specific data for the diploma level is not available in the BTEB data repository, and hence, enrolments and graduates counted only include HSC, SSC, Dakhil and 360 short courses.

▶ Figure 22. Enrolment and graduation numbers for construction-related programmes in Cox's Bazar, 2019–22



Source: Survey of TVET providers.

▶ Figure 23. Enrolment and graduation numbers for construction-related programmes in the Chattogram region, 2019–22

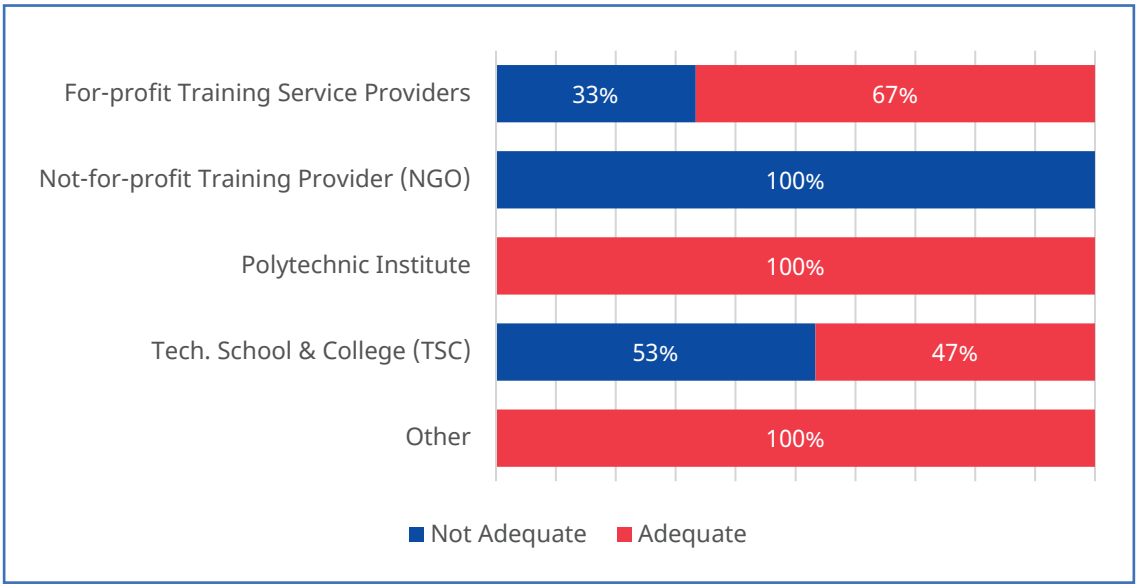


Source: Survey of TVET providers.

2.8.7. Adequacy TVET providers' equipment

Figure 24 highlights a notable discrepancy in the adequacy of the construction training equipment among different training providers[5]. All of the polytechnic institutes, being government-funded, reported having adequate equipment, ensuring comprehensive training for construction courses. By contrast, not-for-profit providers, operating on a donor funding-based model, all lacked sufficient construction equipment, often outsourcing as needed for specific projects. Among technical schools and colleges, which prioritize basic knowledge, 53 per cent did not have adequate construction training equipment, as their curricula often do not extensively require heavy machinery. Among for-profit training service providers, even though 67 per cent reported having adequate equipment, many face challenges due to the higher enrollment fees required for courses involving heavier equipment. Despite charging these higher fees, when needed, these providers still typically outsource equipment for training, reflecting a nuanced landscape where funding sources and course specialization impact the availability of up-to-date and well-functioning construction equipment for skills development.

▶ Figure 24. Adequacy of training equipment in construction-related training programmes, by type of TVET provider (%)



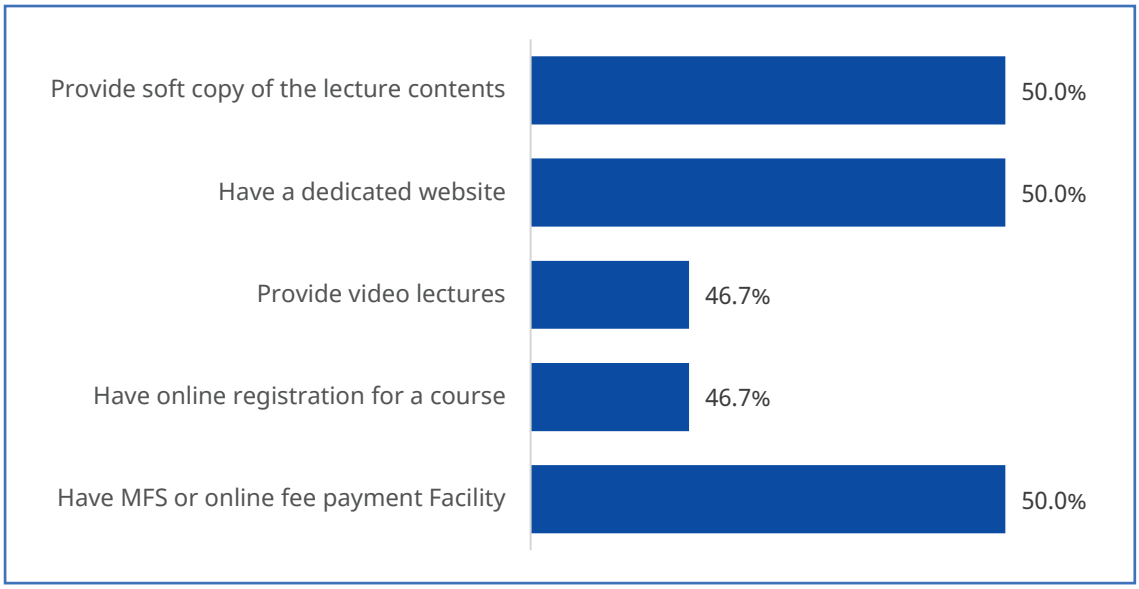
Source: Survey of TVET providers.

2.8.8. Digitization of TVET services

Digitalization in construction sector-related training is relatively low, with roughly 50 per cent (or less) of TVET providers offering various digital learning materials and resources. Consequently, construction-related courses are not adequately digitized, with roughly half of TVET providers not offering lecture materials in soft copy format and not maintaining dedicated websites. As a result, students do not have access to online course materials and do not have any learning management system. In general government-run organizations such as TTCs and TSCs have and give access to online registration to students. NGO and for-profit providers generally do not have access to online registration capabilities.

5 It should be noted that these figures on equipment adequacy are based on self-reported assessments offered by the TVET providers themselves, and have not been independently verified.

▶ Figure 25. Digitization status of TVET providers in regard to construction sector-related programmes (%)



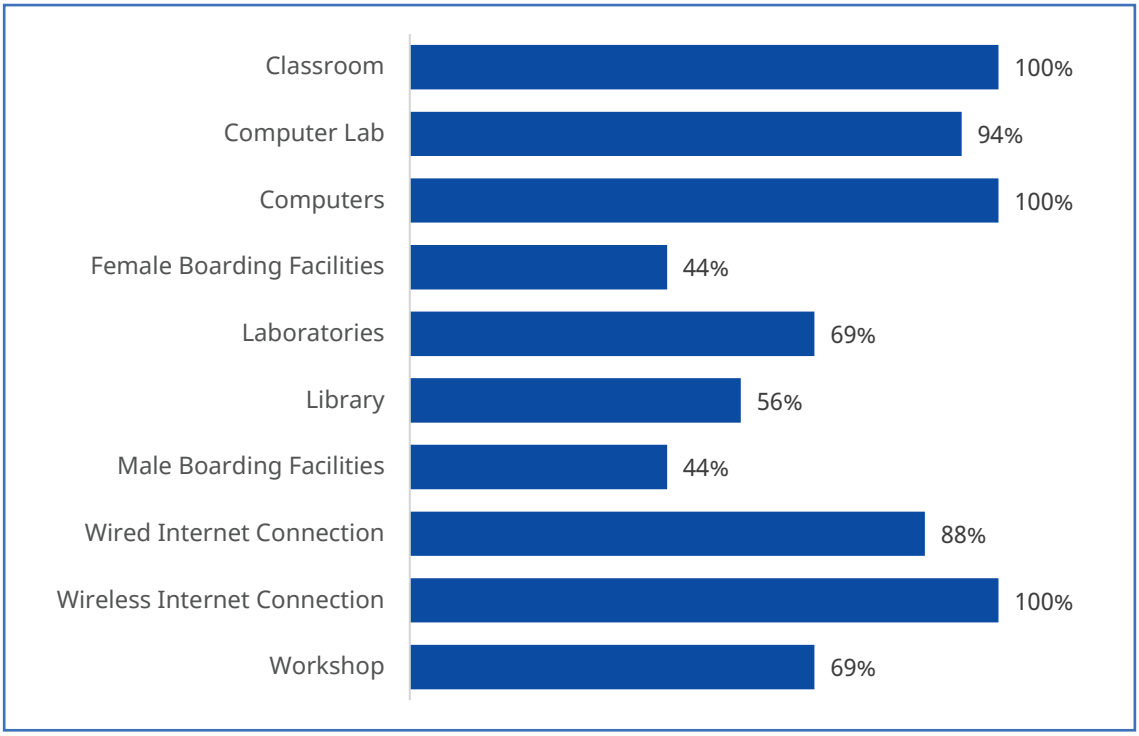
Source: Survey of TVET providers.

2.8.9. Status of facilities available at TVET providers

In terms of the facilities provided, all TVET providers with construction-related courses offer classrooms, computers and WiFi. Some also have computer labs, as most of the TVET providers also offer courses in related to the ICT sector. However, only 69 per cent of TVET providers have workshops. More importantly, only 44 per cent of TVET providers have boarding facilities for their trainees, both male and female, and there are no boarding facilities dedicated only to construction course trainees.

Conversation with instructors and trainees revealed some concerns regarding the scarcity of facilities. According to them, if providers can expand their facilities, they will be able to accommodate more trainees and give higher quality training.

▶ Figure 26. Facilities available in TVET providers offering construction sector-related programmes (%)

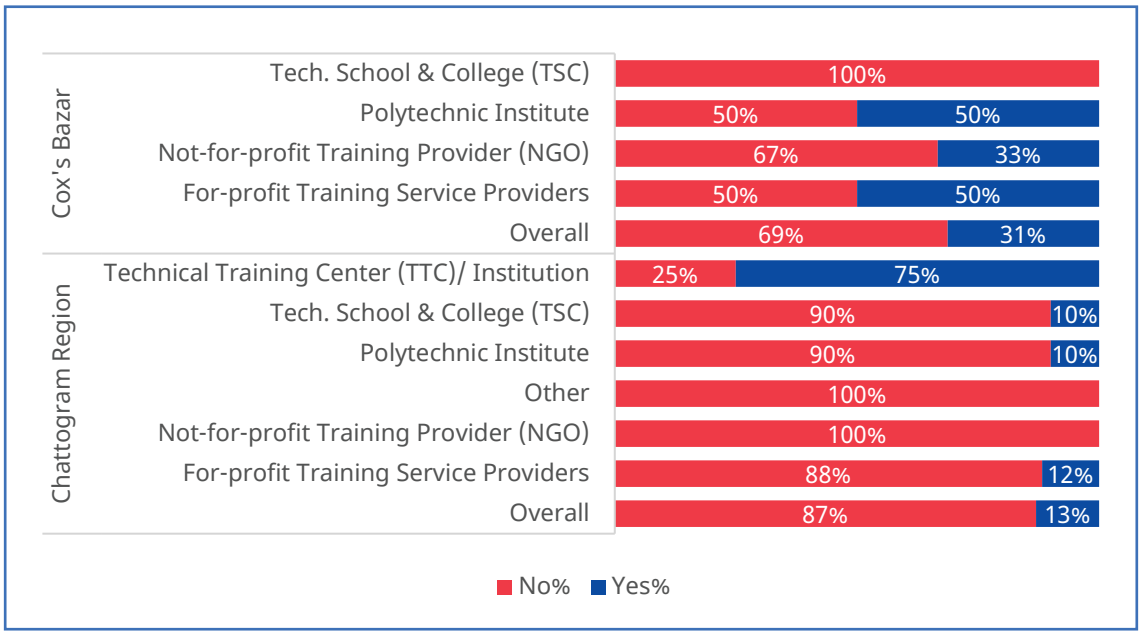


Source: Survey of TVET providers.

2.8.10. TVET providers' capacity to provide Recognition of Prior Learning

Recognition of Prior Learning (RPL) is a sought-after service by various stakeholders, as it guarantees acknowledgment of the skills of experienced workers and provides them with formal certification, enhancing their prospects for future employment and promotions, as well as improving access to lifelong learning opportunities. Despite high demand, the availability of RPL is limited among many TVET providers offering construction-related courses. According to KIIs with TVET providers, this lack of RPL is primarily due to a capacity gap in assessment capabilities. Specifically in regard to construction, TVET providers face challenges in accessing certified assessors and the assessment facilities necessary for implementing RPL. The BTEB is actively encouraging training centres to incorporate RPL by offering assistance to overcome these existing capacity constraints.

▶ Figure 27. Status of construction-related RPL offerings in TVET providers, by type of provider (%)

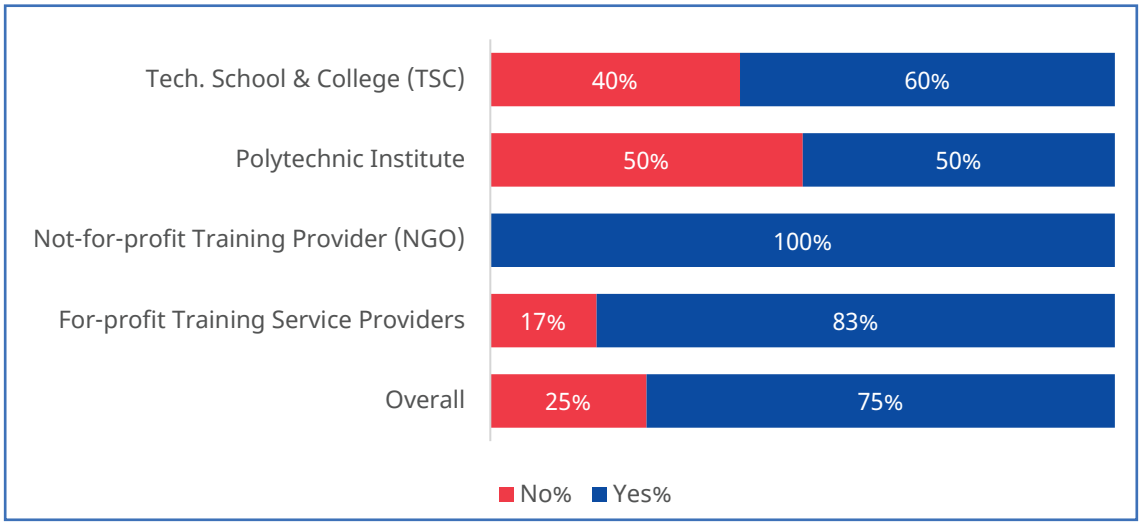


Source: Survey of TVET providers.

2.8.11. TVET provider collaborations/linkages with community-based organizations (CBOs), NGOs and social organizations

The research team observed that NGO-based and for-profit TVET providers generally uphold effective communication practices in regard to accountability and programme branding. However, this communication tends to be more individual-centric, with limited opportunities for trainers and trainees to engage in networking through meaningful interactions.

▶ Figure 28. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on construction-related programmes (%)

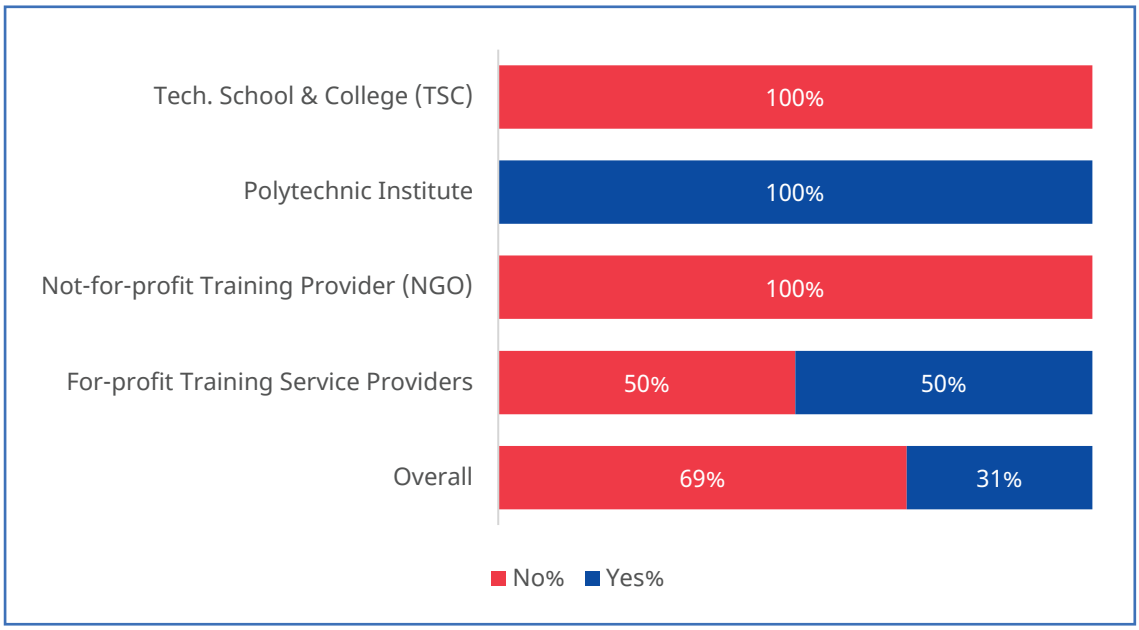


Source: Survey of TVET providers.

2.8.12. Share of TVET providers with placement cells for graduates

The presence of a placement cell in TVET providers is uncommon, indicating a lack of substantial connections with industries for graduate placement. Specifically, there is a scarcity of sector-specific placement cells. The research team noted that polytechnic institutes address this gap by establishing memoranda of understanding (MOUs) with various industries. Additionally, for-profit training providers, to some extent, maintain placement cells to monitor and showcase their success in placing graduates and to sustain communication with industries. In the FGDs, it was revealed that some former trainees secured employment through personal connections with their trainers or instructors, highlighting the informal nature of industry linkages. Only a small percentage reported receiving job offers through TVET provider placement cells. Interviews with placement cell offices indicated a prevalent lack of networking capacity and insufficient numbers of dedicated staff. Administrative officers were found to sometimes handle placement responsibilities due to the absence of specialized officers for this purpose.

▶ Figure 29. Share of TVET providers offering construction-related programmes that have placement cells for graduates (%)

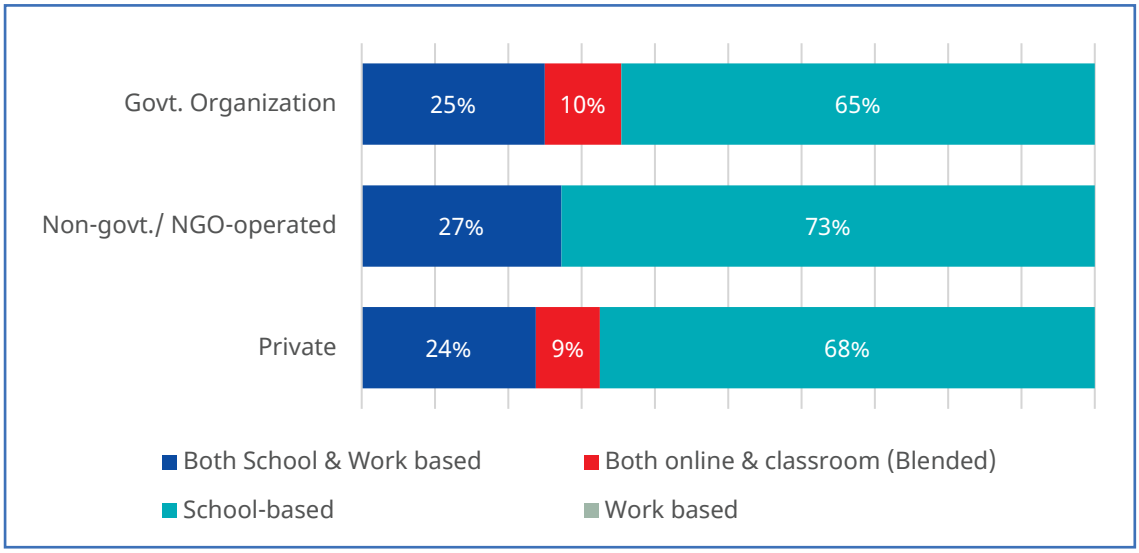


Source: Survey of TVET providers.

2.8.13. Course delivery mechanisms

In delivering construction-related courses, all of the TVET providers utilize school-based training, as the courses require hands-on training and learning how to operate different pieces of equipment. Most providers only provide school-based training, with this being the case for 73 per cent of NGO-operated providers, 68 per cent of private providers, and 65 per cent of government-run providers (65 per cent). In addition to school-based learning, roughly a quarter of providers also utilize work-based methods of training, with this being the case in 27 per cent of NGO providers, 25 per cent of government-run providers, and 24 per cent of private providers. Work-based training is offered via different types of apprenticeships in industry or local enterprises. A smaller share of providers have adopted a hybrid online/offline method of delivering training that combines school-based training with online lessons, especially among government-run providers (10 per cent) and private providers (9 per cent). This is evidently a result of COVID-19, which the opened the door for online-based training.

▶ Figure 30. Course delivery method for construction sector-related TVET programmes, by owner/operator of the TVET provider (%)



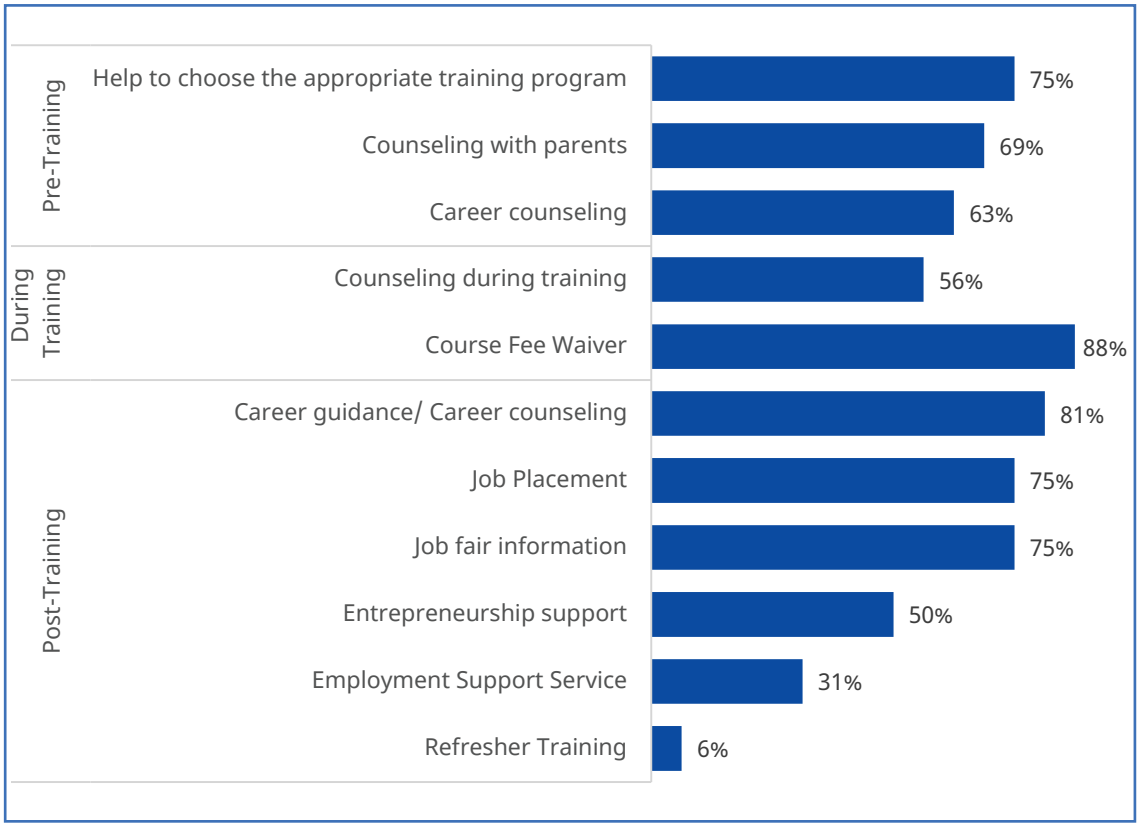
Source: Survey of TVET providers.

2.8.14. TVET providers' support services

In addition to providing training, TVET providers also deliver various types of support services for their trainees. Among TVET providers offering construction-related courses, the most commonly reported pre-training support services were vocational guidance, counseling with parents, and career counseling (figure 31). Career guidance was the most commonly reported post-training support service. TVET providers also try to arrange jobs for graduate trainees, if any opportunities are available. Moreover, entrepreneurship support, employment support service, and refresher training were a few of the post-training support services reported by TVET providers for construction course trainees. They also provide counseling during training. Moreover, 88 per cent of TVET providers said they consider course fee waivers for trainees, if needed. A few TVET providers also reported they conduct motivational sessions and give scholarships to trainees.

In discussion with trainees and trainers, it was also found that students generally can actually acquire these types of services if they need them. However, there were some reported instances where trainees faced a lack of connection with the trainers and instructors, and consequently get deprived of these services.

▶ Figure 31. Support services available at TVET providers offering construction-related programmes (%)



Source: Survey of TVET providers.

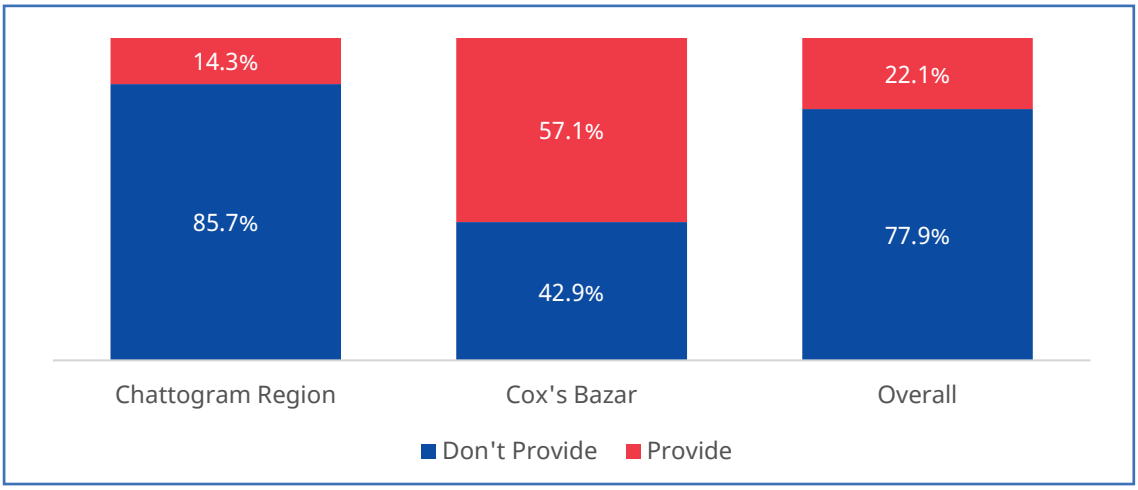
2.8.15. Status of work-based learning, including apprenticeships

As internships/apprenticeships can be crucial for enhancing the learning gathered through school-based training and for kick-starting one's career, TVET providers often provide them through linkages with different industries and local companies or entrepreneurs.

However, in regard to construction-related courses, internship/apprenticeship opportunities are limited for trainees and graduates, as the present scenario suggests that just 22 per cent of TVET providers offer apprenticeship opportunities – meaning more than three-quarters of TVET providers with construction courses in the Chattogram–Cox's Bazar region do not offer apprenticeships. However, it should be noted that there is a serious gap in this respect between providers in the Chattogram region and those in Cox's Bazaar, as only 14 per cent of TVET providers in the Chattogram region offer formal apprenticeships, whereas in Cox's Bazar more than half of the courses (57 per cent) provide such an opportunity.

The study team gathered similar information from discussions with trainees, graduates and labour market intermediaries. For example, graduates from the Chattogram Hill Tracts areas are less likely to be engaged in industries that require higher mobility (such as construction), and this as a result discourages TVET providers from establishing meaningful linkage with such industries, which shrinks the opportunities for internships/apprenticeships. There also remains a gap in awareness regarding opportunities for apprenticeships, which the study team observed during the FGDs, as a majority of the trainees in these discussions were not aware of the apprenticeship offered by their TVET providers.

▶ **Figure 32. Availability of apprenticeship opportunities linked to construction-related TVET programmes (%)**



Source: Survey of TVET providers.

2.8.16. Internal factors affecting the sustainability of TVET providers

▶ **Table 8. Presence of internal factors affecting the sustainability of TVET providers offering construction-related courses**

Internal factor	For-profit TVET providers	Not-for-profit TVET providers (NGOs)	Polytechnic institutes	TSCs
Have strategic plan/long-term plan	100%	33%	100%	80%
Have annual work/ operational plan for employees	83%	33%	100%	100%
Have separate human resources (HR) department	67%	67%	100%	0%
Have HR policy	50%	33%	100%	60%
Have separate accounts department	100%	100%	100%	100%
Perform internal financial audits	100%	100%	100%	100%
Audited by external auditor	17%	67%	100%	80%

TSCs = Technical schools and colleges. Source: Survey of TVET providers.

2.8.17. Future plans and sustainability mechanisms of TVET providers

Drawing from the qualitative data, the study team observed that for TVET providers offering funded courses, sustainability could be ensured through employing a fee-based model of enrolling students. Moreover, formal linkage with industries would also enable TVET providers to be more sustainable in the case of the construction sector, as this will offer the opportunity to train students on industry needs and required qualifications.

TVET providers mostly follow traditional methods of delivering services, meaning there is space to consider adopting digitization in registering students (online registration) and in following international benchmarks in delivering training to up-skill trainees with an aim to boost remittances through overseas employment. In addition, TVET providers should aim to embrace more RPL, both for courses targeting different trades in the sector and to fully certify a handful of students, in order to foster the growth of the sector by supplying more workers to meet local demand and to contribute more to the local economy. In line with this aspiration, TVET providers need financial support from the Government and from NGOs to increase their capacities to contribute more to the construction sector and also for their own long-term growth. In addition, TVET providers might consider moving from funding-based model to fee-based course offerings.

▶ 2.9. Skills gap analysis

From the ESS, major occupations for the construction sector were identified, and during the STED Workshop, stakeholders also identified the most in-demand occupations and skills in the sector. On the other side of the equation, the skills supply assessment identified the range of TVET providers offering construction-related skills development programmes. Based on the information gathered from the STED Workshop and the primary surveys, the training gap analysis table below was constructed. Table 8 shows major occupations in the construction sector, the relevant skills training required, and the degree to which this training is available. Availability frequency was derived from the frequency with which a specific course/training was reported by TVET providers and how related that skill training is to each specific occupation.

▶Table 9. Training gap analysis for priority occupations in the construction sector

Major occupations	Skills training needed from TVET providers	Availability of training	Remarks
Mason	▶ Brick fitting ▶ Ingredient mixing ▶ Flooring ▶ Roofing	Inadequately available	Mainly available at the informal level
Tile Fitter	▶ Tile cutting and fitting	Inadequately available	Mainly available at the informal level
Plumber	▶ Installing plumbing fixture ▶ Troubleshooting plumbing problems ▶ Repairing pipes and tubes ▶ Installing and maintaining drainage systems	Adequately available	
Carpenter	▶ Window and door fitting repairing wood structures	Adequately available	
Construction Electrician	▶ Electrical House Wiring and Maintenance ▶ General Electrical Works ▶ Electrical and Electronic equipment installation and maintenance	Adequately available	
Painter	▶ Repairing cracks and holes in wall ▶ Applying paint ▶ Varnishing	Not available	
Interior Designer	▶ Drawing interior designs, 3D modelling	Not available	
Foundation Worker	n/a	Not available	
Demolition Worker	n/a	Not available	
Heavy Equipment Operator (Crane, Excavator)	▶ Forklift operation and maintenance	Not available	Only available in Chattogram for port-related operations
Aluminum Fabricator	▶ Welding and fabrication	Inadequately available	

For some of priority occupations in the construction sector, such as Plumbers and Construction Electricians, skills training is adequately available. But for some in-demand occupations, such as Foundation Workers and Demolition Workers, there is no skills training available in the Chattogram–Cox's Bazar region.

▶ 2.10. Recommendations

The STED Workshop served as a forum for stakeholders to not only validate the outcomes of the surveys, FGDs and KIIs, but also to contribute additional perspectives. It facilitated the development of a collective comprehension regarding skills needs and challenges in the sector. Moreover, this collaborative platform enabled stakeholders to generate recommendations aimed at addressing the identified and prioritized skills needs and challenges, fostering a pathway for future growth and success in the construction sector.

Specific occupational skills

- Initiatives should be taken to increase the number of certified trainers based on identified skills gaps. The BTEB can coordinate with TVET providers and enhance trainer development programmes to cater to regional demand.
- Increase the number of female trainers to cater to female trainees, particularly for in demand courses such as CAD, CAM, interior design, and so on.
- Develop and incorporate courses that align with national and international demand in the construction industry. Ensure that these courses are designed to accommodate desk-based work and freelancing opportunities, making them more accessible to women. Also ensure periodic updates of curricula to match with contemporary trends.
- Expand the current course offerings by introducing advanced modules (NSC Levels 3 and 4) for existing basic courses in the targeted regions. This progression allows individuals to obtain the advanced certification needed to be semi-skilled to skilled workers.
- Identify reputable TVET providers in different upazilas and facilitate their affiliation as registered training organizations under the BTEB. This involves a process of expanding the coverage of training programmes in remote areas.
- Conduct training programmes and workshops for registered training providers to equip them with the knowledge and tools required for effective RPL. This involves understanding assessment methodologies and aligning them with national qualifications.
- Form partnerships with equipment manufacturers to design and implement specialized training programmes. These programmes should focus on the operation, maintenance and troubleshooting of advanced machinery – aligning the training with industry needs.
- Certified experts on the use of excavators, crane forklifts and other heavy construction equipment need to be made available to meet industry demand. Growth in these occupations will also bring about a need for technicians and repairers of this machinery, creating new potential occupations for TVET providers to cater to.
- Masons are clearly in demand, and there is consequently a need for formal skill development covering a diverse set of related skills, such as brick laying, flooring, roofing, plastering and so on. These skills are currently included in the formal curricula of some TVET providers at present, but are not widely available across the formal courses in the region, prompting many to enrol in informal masonry courses instead. Therefore, formal courses for masonry should be spread out across this construction-heavy region. The same is also applicable for tile fitting and plumbing courses.

Core work skills

- Strengthen core competencies such as problem-solving, critical thinking and adaptability to enable workers to handle complex projects and unexpected challenges.
- Enhance digital literacy across the workforce to ensure all levels of employees are comfortable with using technology that is increasingly being integrated into construction processes.
- Promote a culture of safety and environmental awareness as central components of all training and development initiatives.

Collaboration between employers and training providers

- Create industry advisory boards that include representatives from construction firms, trade unions, technical schools, and community organizations to inform training programmes and policies, and to ensure that curricula are aligned with industry needs and provide relevant up-to-date training. Social media-based groups can be formed to enhance communication. The Construction ISC should be actively working at the regional level to ensure collaboration between regional employers and TVET providers.
- Organize job fairs and campus recruitment events to connect graduating students directly with potential employers. These events provide a direct avenue for jobseekers to interact with industry representatives, explore career opportunities, and secure employment.
- Formalize agreements through MOUs and contracts between TVET providers and industries. Clearly outline the terms for apprenticeships, internships and workplace-based learning to ensure a structured and mutually beneficial engagement.
- Foster collaboration between local TVET providers and foreign agencies involved in construction projects. Leverage this collaboration for advanced technology-based training, knowledge transfer and opportunities for employment. This ensures that local training programmes stay abreast of international standards and technological advancements.
- Employers need to facilitate proper utilization of skill-specific occupations properly by ensuring that skilled individuals are hired for roles that adequately utilize their specific skills. This can be done by collaborating with TVET providers in terms of defining the occupations, determining roles and responsibilities, and designing the curriculum.

Access to skills development, social inclusivity and lifelong learning

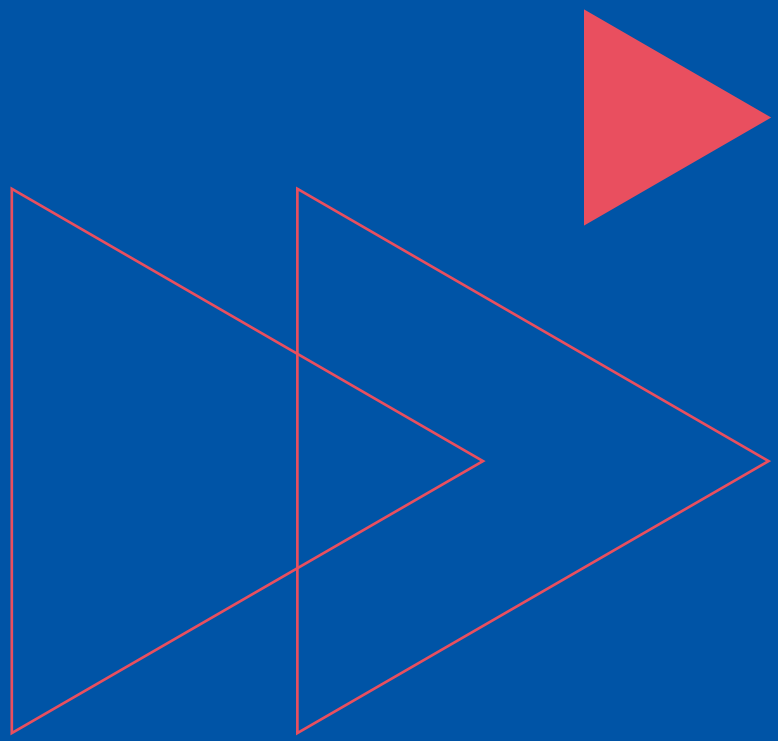
- Ensure that the infrastructural and training capacities of TVET providers are designed to be inclusive, catering to vulnerable community youths, women, and persons with disabilities. This may involve the incorporation of features such as ramps, railings and assistive equipment to facilitate equal access.
- Incorporate RPL programmes tailored to priority occupations, ensuring that workers at different levels can engage in lifelong learning and certification processes. This approach aligns training with the evolving demands of the industry.
- Implement training for sustainable practices and integrate green building standards.
- Advocate for TVET providers to upgrade career counseling initiatives and job placement programmes to reduce dropout rates.

Wider systemic changes

- Improve the negotiation process of bilateral agreements on worker recruitment to enhance the participation of local workers in mega construction projects. This involves ensuring that the terms of such agreements are favourable to the inclusion of a skilled local workforce.
- The Government should communicate the anticipated demand for skilled resources in future projects so that local TVET providers can align their training programmes to meet these upcoming requirements, thereby fostering the development of local resources.

3

Tourism and hospitality sector



Chapter 3. Tourism and hospitality sector

▶ 3.1. Introduction

The tourism and hospitality sector of the Chattogram–Cox's Bazar region is a significant part of the economy and culture of the region. The tourism and hospitality sector of Chattogram offers a variety of attractions and services to domestic and international visitors. While Cox's Bazar is one of the most popular tourist destinations in the country and is famous for its long sandy beach that stretches for 120 km – the longest natural sea beach in the world. The tourism and hospitality sector of Cox's Bazar is a vital part of the local economy, providing employment, income and social benefits to residents.

The tourism and hospitality sector comprises various subsectors, such as accommodation, food and beverage, travel and tours, entertainment, recreation, and souvenirs. Each subsector has its own specific skills requirements, depending on the nature and level of the service provided. Future job demand in Bangladesh's tourism and hospitality sector was assessed by a 2018 study that found that by 2027 the domestic tourism and hospitality sector will demand 1,263,287 jobs (Barkat et al. 2018). Tourism is therefore expected to generate huge numbers of additional jobs in the Chattogram–Cox's Bazar region, as the area is already well known as a prime tourism destination.

▶ 3.2. Profile and situation analysis for the tourism and hospitality sector

3.2.1. Economic profile

According to the then-state minister for civil aviation and tourism, the tourism and hospitality sector contributed 950.7 billion taka to the national income, which is equivalent to 4.40 per cent of GDP in 2019–20 (New Age 2021). The tourism and hospitality sector is one of the major sources of foreign income, with some 840,000 foreign visitors to Bangladesh annually, with an additional 13,700,000 domestic tourists visiting tourism locales across the country annually (Bangladesh, BIDA 2021).

The tourism and hospitality sector in the Chattogram–Cox's Bazar region includes accommodation, catering, entertainment, sightseeing, transportation, and other activities that tourists enjoy during their visits to the region (Bhattacharjee and Talukder 2021). The tourism and hospitality sector in the Chattogram–Cox's Bazar region is large enough that in March 2015 it generated 2.37 billion taka in revenue during course of a single three-day holiday,. While there are no regional statistics available at present, it is expected that the regional tourism and hospitality sector will grow further due to the mega-projects being undertaken in the region (Bangladesh, BBS 2020). The tourism and hospitality sector in the region is expected to create more job opportunities and create scope for US$2 billion worth financial activities in the future (New Age 2021).

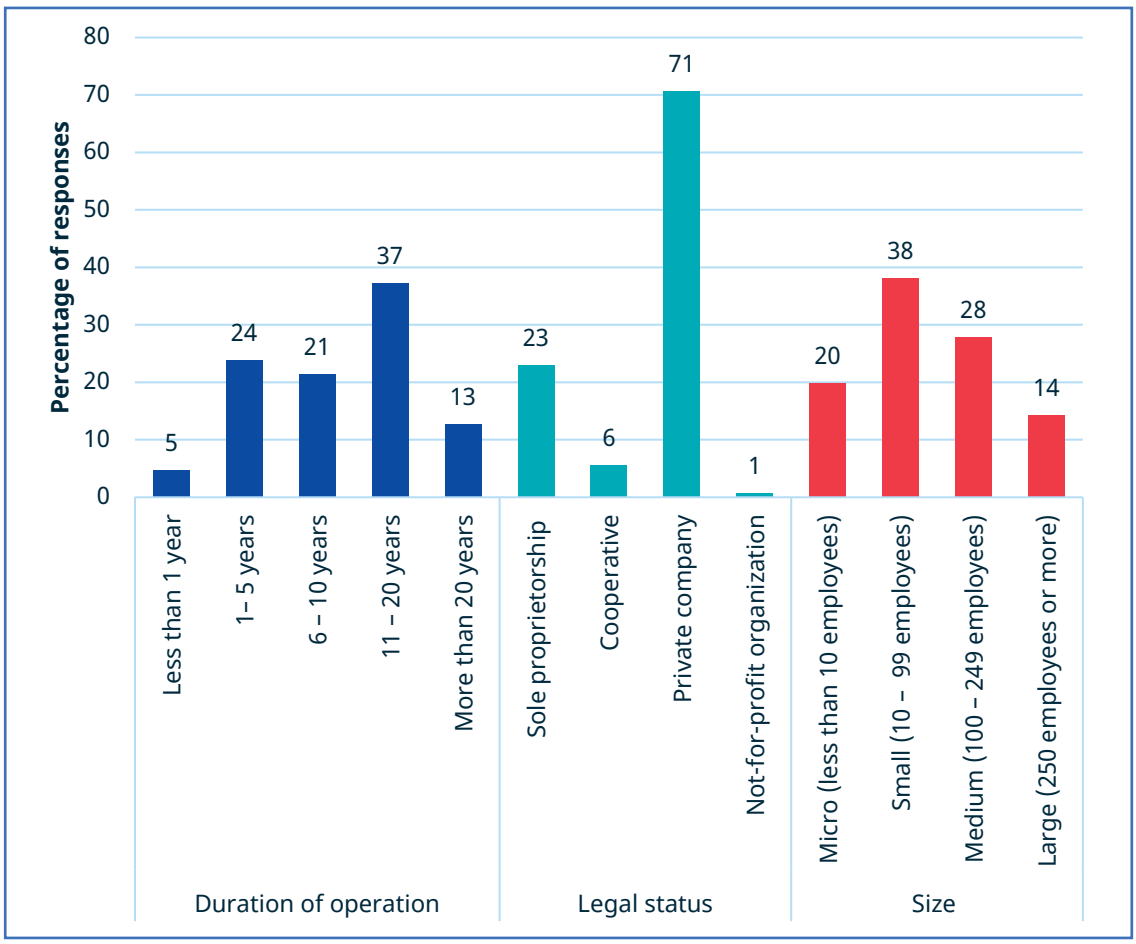
3.2.2. Workforce profile

The livelihoods of about 4 million people are connected with the tourism and hospitality sector in Bangladesh (*New Age* 2021). The average number of persons per establishment in the tourism and hospitality sector in the Chattogram–Cox's Bazar region was 4.4 (Byron and Hasan 2021). The tourism and hospitality sector in the Chattogram–Cox's Bazar region of Bangladesh holds immense potential for job creation, as millions of tourists visit Cox's Bazar annually. Given the significant role of the Chattogram–Cox's Bazar region in Bangladesh's tourism industry, it is likely that a substantial portion of these jobs are to be found in the region (Al Karim and Hassan 2022). This employment generation is a strong indication of the sector's key role in economic development (Bangladesh, Ministry of Civil Aviation and Tourism 2021).

3.2.3. Business profile

The number of tourism and hospitality-related establishments across the target five districts can be found in Economic Census 2013 data. It is evident from the census that the largest number of tourism and hospitality-related establishments are in Chattogram (35,744), with Cox's Bazar a distant second at 7,183. The district with the lowest number of establishments is Rangamati, with 2,374 establishments.

▶ Figure 33. Overview of surveyed tourism and hospitality sector enterprises: Length of business operation, legal status and size of enterprise (no. of respondents, N= 126)



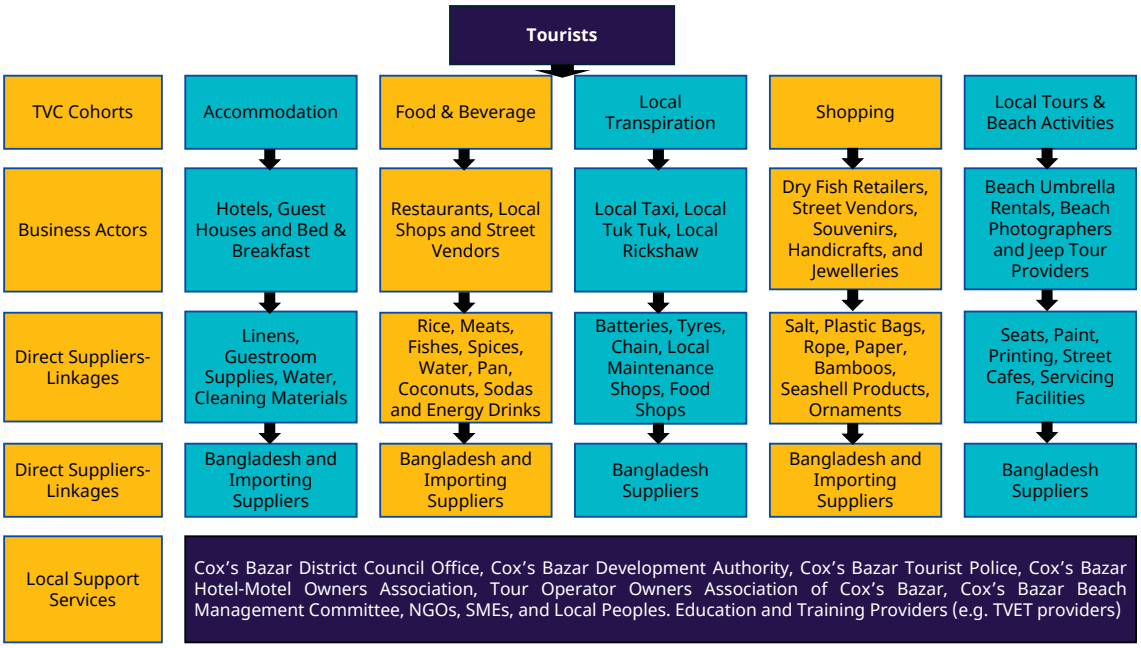
Source: ESS 2023

For the ESS conducted for this study, a total of 126 tourism establishments of all sizes were surveyed in the Chattogram–Cox's Bazar region. The vast majority of the surveyed enterprises – 71 per cent – were private companies, followed by sole proprietorships (23 per cent) (figure 33). The survey contained a good mix of enterprise sizes, comprising 38 per cent small, 28 per cent medium, 20 per cent micro and 14 per cent large. Roughly half of the surveyed businesses have been in operation for more than a decade (37 per cent at 11–20 years and 13 per cent at more than 20 years), indicating a mature industry, but not a stagnant one, as a substantial proportion of surveyed enterprises were relatively young, with 29 per cent having been established within the last 5 years.

3.2.4. Value chain analysis

The tourism and hospitality sector value chain in the Chattogram–Cox's Bazar region as depicted in figure 34 below was developed from the secondary review and was validated in the STED Workshop in the presence of sector representatives. At the top of the value chain are the tourists, who are the consumers driving the demand for various services. Directly servicing this demand are the Tourism Value Chain Cohorts – or "TVC Cohorts" in the figure below – which include accommodation, food and beverage, local transportation, shopping, and local tours and beach activities. These are the primary offerings tourists interact with. Underneath this tier are the "Business Actors", such as hotels, guest houses, restaurants, and local transport services such as taxis and rickshaws, which provide direct services to tourists. Supporting these Business Actors are the "Direct Suppliers-Linkages", which supply essential items such as linens, food ingredients, vehicle parts, and shopping goods, such as souvenirs. These Suppliers source from both local ("Bangladesh Suppliers") and international markets ("Importing Suppliers"), which are noted separately, indicating the blend of local and global components in the supply chain.

▶Figure 34. Value chain of the tourism and hospitality sector



At the bottom of the chain are "Locals Support Service", which include entities that provide the necessary infrastructure, regulations and support services to ensure the smooth operation of the tourism and hospitality sector. This includes local councils, development authorities, police, hotel and motel owner associations, NGOs, and local MSMEs, as well as educational and training providers such

as TEVT institutions. These organizations and entities play a crucial role in maintaining the standards of the services provided, enhancing the quality of the tourist experience and managing the impacts of tourism on the local environment and community. Overall, this value chain illustrates the complexity of the tourism and hospitality sector and the many stakeholders involved in delivering a comprehensive tourism experience.

3.2.5. Institutional mapping for the tourism and hospitality sector

Institutional mapping of tourism and hospitality sector of the Chattogram–Cox's Bazar region led to the identification of several key organizations, each playing a distinct role in the growth and management of the industry. Below is a brief institutional map of the sector; a more detailed table of institutions is available in Annex 2 (annex table 4).

- **National Tourism Council (apex body):** The National Tourism Council holds a supervisory role over the entire tourism and hospitality sector, setting overarching goals and ensuring that all activities align with national tourism strategies. They guide policy development and coordination among various entities involved in tourism.
- **Ministry of Civil Aviation and Tourism:** The Ministry has a dual role, overseeing both civil aviation and tourism and hospitality-related matters. It is responsible for policy formulation, regulation and promotion of tourism in the region, while also ensuring that the aviation sector supports the tourism industry's expansion and sustenance.
- **Bangladesh Tourism Board (BTB):** The BTB is the national tourism organization responsible for promoting tourism in Bangladesh. It plays a critical role in marketing and public relations, aiming to enhance the country's image as a tourism destination and overseeing the execution of tourism activities.
- **Bangladesh Parjatan Corporation (BPC):** The BPC manages a range of tourism and hospitality-related facilities, including hotels and motels. Its role is operational, ensuring that the accommodation facilities meet international standards to attract and cater to both domestic and international tourists.
- **Forest Department:** With the responsibility for managing tourism activities in protected areas such as the Sundarbans, the Forest Department is key in balancing conservation efforts with sustainable tourism practices, thereby preserving natural resources while promoting ecotourism.
- **Bangladesh Economic Zones Authority (BEZA):** By creating and managing economic zones, BEZA contributes to the tourism and hospitality sector by attracting investment and tourists, boosting economic activity, and creating employment opportunities within the region.
- **Bangladesh Investment Development Authority (BIDA):** BIDA provides essential services, such as registration, counselling and aftercare, to businesses in the tourism and hospitality sector. Its role is to facilitate investment and support business operations within the industry.
- **Hotels, motels and airports:** These facilities are the front-line service providers in the tourism and hospitality sector. Hotels and motels provide accommodation, while airports are crucial for facilitating the arrival and departure of tourists, directly influencing the tourist experience.
- **Private sector:** The increasing involvement of private sector entities in the tourism industry signifies their importance in service provision, infrastructure development, and decision-making. They bring innovation, investment and industry best practices to the sector.\
- **Technical experts and education and training providers:** These entities contribute specialized knowledge and expertise to the industry. They offer education and training programmes, equipping individuals with the skills necessary to work in various tourism and hospitality-related occupations, thus enhancing the sector's professionalism and service quality.

Together, these institutions form a comprehensive network that supports the tourism and hospitality sector's infrastructure, promotion, management and workforce development, contributing to the Chattogram–Cox's Bazar region's viability as a thriving tourism destination.

3.2.6. Analysis of the business environment: SWOT and drivers of change

The SWOT analysis of the tourism and hospitality sector in the Chattogram–Cox's Bazar region below presents an overview of the internal and external factors that can influence the area's tourism development. This analysis was performed based on KIIs and STED Workshop discussions.

- **Strengths**
  The Chattogram–Cox's Bazar region boasts several intrinsic strengths that make it a potentially vibrant tourism hotspot. The region is home to the world's longest sea beach, offering unique natural resources that can attract beach lovers and nature enthusiasts. Its rich archaeological and historical sites, along with the natural beauty and lush greenery, provide a solid foundation for cultural and ecotourism. The area is known for its hospitality, which, along with its rich cultural heritage and religious harmony, can enhance the visitor experience. Good connectivity through international air travel and the availability of accommodations, including reputed international hotel chains, further add to its appeal as a tourist destination.

- **Weaknesses**
  Despite these advantages, the region faces several weaknesses that hinder its tourism growth. Many tourist sites are underexplored and mismanaged, leading to untapped potential. Insufficient investment in the sector, low-quality services, and concerns about safety, security and hygiene could dissuade potential visitors. Inadequate infrastructure, complex visa procedures, limited marketing and promotional activities, a lack of private sector initiatives, high prices for certain tourism components, and a shortage of professional guides are all areas that require immediate attention to improve the sector's appeal and functionality.

- **Opportunities**
  The tourism and hospitality sector in the Chattogram–Cox's Bazar region has a wealth of opportunities. Globalization and improved communication technologies can facilitate the dissemination of information, making it easier to market and promote the region's attractions. There is potential to enhance the appeal of tourist spots and to develop a robust tourism culture. Investing in research and development can help attract a diverse tourist demographic; while hosting international events can increase the region's visibility on the global stage. Furthermore, the development of favourable tourism policies can provide a conducive environment for growth and investment in the sector.

- **Threats**
  However, there are significant threats that the region must navigate. Political instability can deter tourists and investors alike. Issues such as airport harassment, police-related problems, language barriers, and a conservative social and religious system could negatively impact the tourism experience. The region also faces strong competition from neighboring areas with developed tourism and hospitality sectors. A negative image and misconceptions about Bangladesh, lack of awareness about the benefits of tourism, the impact of illegal hunting and fishing on wildlife, shortages of accommodation and services, inadequate safety measures, and the absence of a comprehensive tourism policy are all challenges that could impede the growth of tourism in the region. Additionally, ethnic and political conflicts can further complicate the tourism landscape.

▶ 3.3. Profile of major occupations

Through the ESS, KIIs, FGDs and the STED Workshop the study was able to produce an extensive list of key occupations in the tourism section in the Chattogram—Cox's Bazar region. While table 9 below provides only the major occupations in the tourism and hospitality sector, annex table 9 provides a more detailed list, along with the skills needed for each occupation and the level of priority that each occupation holds in the sector.

▶Table 10. Major occupations in the tourism and hospitality

Construction of roads and railways	Food and beverage	Entertainment
▶ Hotel Manager ▶ Guest House Manager ▶ Housekeeping ▶ Hotel Supplies Providers ▶ Front Desk Executive ▶ Physical Technician ▶ Tourist Services ▶ Tour Guide ▶ Tour Operators ▶ Translator ▶ Reservation ▶ Office Management	▶ Manager ▶ Chef/Cook ▶ Barista ▶ Waiter ▶ Street Vendors ▶ Catering	▶ Singer ▶ Magician ▶ Photographer ▶ Event Management
	Transportation	**Recreation**
	▶ Local Taxi Driver ▶ Tuk Tuk Driver ▶ Rickshaw Puller ▶ Bus Helpers ▶ Bus Drivers ▶ Cruise Ship ▶ CNG Drivers	▶ Wellness and Spa
		Ecotourism
		▶ Eco-tour guide
		Local entrepreneurship
		Sports tourism
		▶ Surfing Trainers ▶ Parasailing Operator

Source: STED Workshop and primary survey.

Accommodation and catering subsector

Under the accommodation and catering subsector, Hotel Managers, Guest House Managers, and Hotel Supplies Providers represent some of the key occupations, and at the moment there appears to be an adequate supply in the region. However, while their respective skills are considered important and many in these roles may currently meet local standards, in order to tap into the international tourism market, upgrading through proper skills and capacity development would be needed. The Housekeeping and Front Office Management occupations seem to have a higher priority level, not only due to their relevance to the accommodation business, but because customers often receive their direct services.

This indicates a higher need for improvement in skills such as organizational skills, attention to detail, and problem-solving within these roles. The role of a Tour Guide/Eco-Tour Guide, while essential, is marked with a higher priority for improvement in areas such as communication, people skills, and organizational skills.

Food and beverage subsector

Food and Beverage Service, Manager, and Chef/Cook roles can be assigned a higher priority level, as tourists are often highly concerned about food quality, in terms of both hygiene and taste/appeal. This is suggests a need to focus on improving or developing skills in food safety, creativity, and strategic planning in these areas.

Transportation subsector

Local Taxi Drivers, Tuk Tuk Drivers, Bus Drivers, Bus Helpers, and CNG drivers need to be considered for skills enhancement, indicating that their existing level of driving and communication skills meets industry needs while still requiring consistent attention. The occupation of Rickshaw Puller can also be listed with a higher priority, which could reflect a need for better communication and first aid skills among individuals in this role.

Entertainment subsector

Occupations such as Singer, Magician, Photographer, and Event Management are also part of the tourism and hospitality sector, and there are suggestions that the skills needed for performance, showmanship, and organizational ability are currently at an acceptable level, but that maintaining and improving these skills remain important.

Sports tourism subsector

For niche roles such as Surfing Trainers and Parasailing Operators, their skills serve as potential future draws for the tourism industry, which is likely to have a steady demand for these specialized skills, but there is no immediate critical gap.

Common roles across all subsectors

Roles such as Security Guard, Sweeper, Assistant, Cleaner, Accountant, and Labourer have been assessed at a medium priority level, indicating that the foundational skills required for these positions are generally being met but there is still a need for regular training and reinforcement.

3.3.1. Major occupations and their required skills

The surveyed tourism and hospitality enterprises were asked to name the major occupations withing their sector (figure 35). Managers were the most commonly identified occupation, having been cited by 88 per cent of enterprises, followed by Chef/Cook (67 per cent), Housekeeping (56 per cent), Supervisors (55 per cent), Catering Service (52 per cent), and Front Office Management (46 per cent).

▶ Figure 35. Major occupations in the tourism and hospitality sector according to surveyed enterprises (% of respondents, N=126)

Note: Multiple responses possible. Source: ESS 2023.

3.3.2. Recruitment

Job vacancies

Figure 36 depicts the job vacancies within tourism and hospitality sector as reported by the surveyed enterprises, which highlights the current demand for specific job roles. The results show that Chefs/Cooks and Catering Service positions were among the most commonly reported vacancy (22 per cent and 21 per cent of enterprises, respectively), indicating a substantial demand for culinary professionals and the importance of dining experiences within the tourism and hospitality sector. Managers roles were among the most commonly reported vacancies (20 per cent of enterprises), but according to sector representatives in the STED Workshop, while Manager positions can usually be filled quickly, there remains a notable shortage of individuals with sufficient experience and skills in the field.

The FGD sessions in Rangamati and Khagrachari underscore the consensus that specific skills are essential for employees in the tourism and hospitality sector to perform effectively. Hotel management training, communication skills, good behaviour and etiquette, and problem-solving skills are highlighted as key competencies that enable employees to conduct their duties efficiently and smoothly.

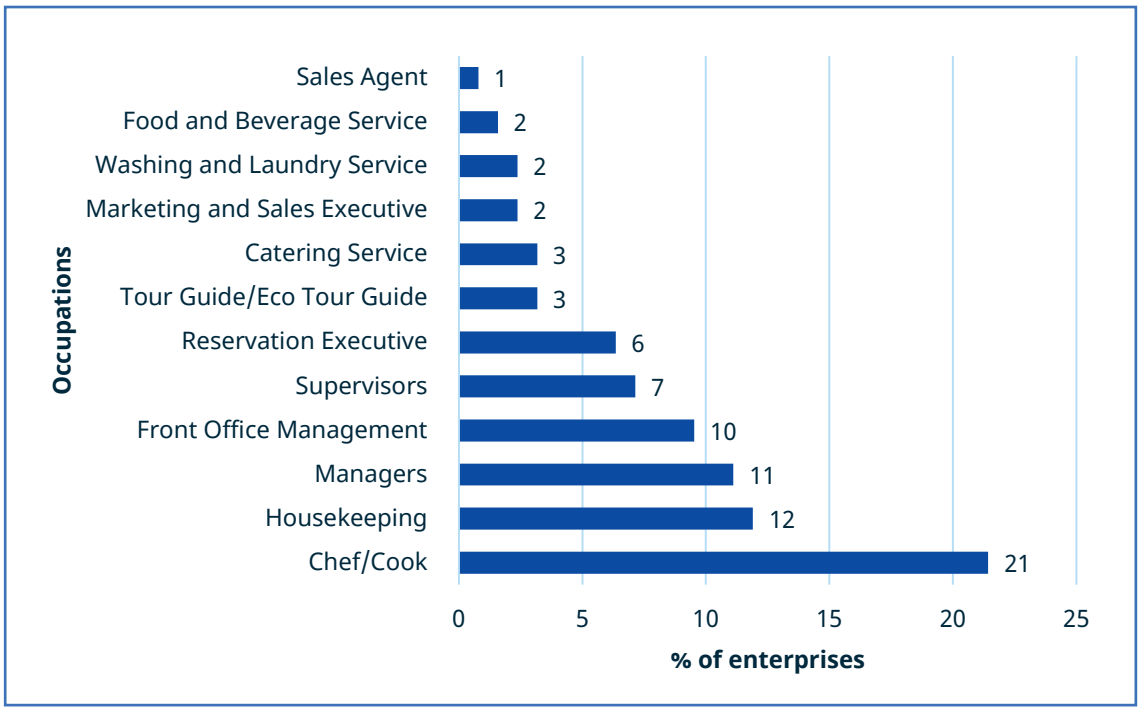
▶Figure 36. Vacant positions in surveyed tourism enterprises (% of respondents, N=126)

Note: Multiple responses possible. Source: ESS 2023.

3.3.3. Hard-to-fill occupations in the tourism and hospitality sector

Figure 37 provides information about occupations that are difficult to fill within the tourism and hospitality sector. The occupation with which enterprises reported having the most significant challenges in filling vacancies is Chef/Cook, with this role cited by 21 per cent of surveyed enterprises. The relatively high percentage reflects the demand for skilled chefs and cooks in the industry. Managers (11 per cent of enterprises), Front Office Management (10 per cent), and Supervisors (7 per cent) were also among the more difficult to fill roles according to enterprises, which indicates that there are some challenges in recruiting experienced professionals who play essential roles in guest services and operational coordination.

▶ Figure 37. Hard-to-fill occupations in the tourism and hospitality sector according to surveyed enterprises (% of respondents, N=126)



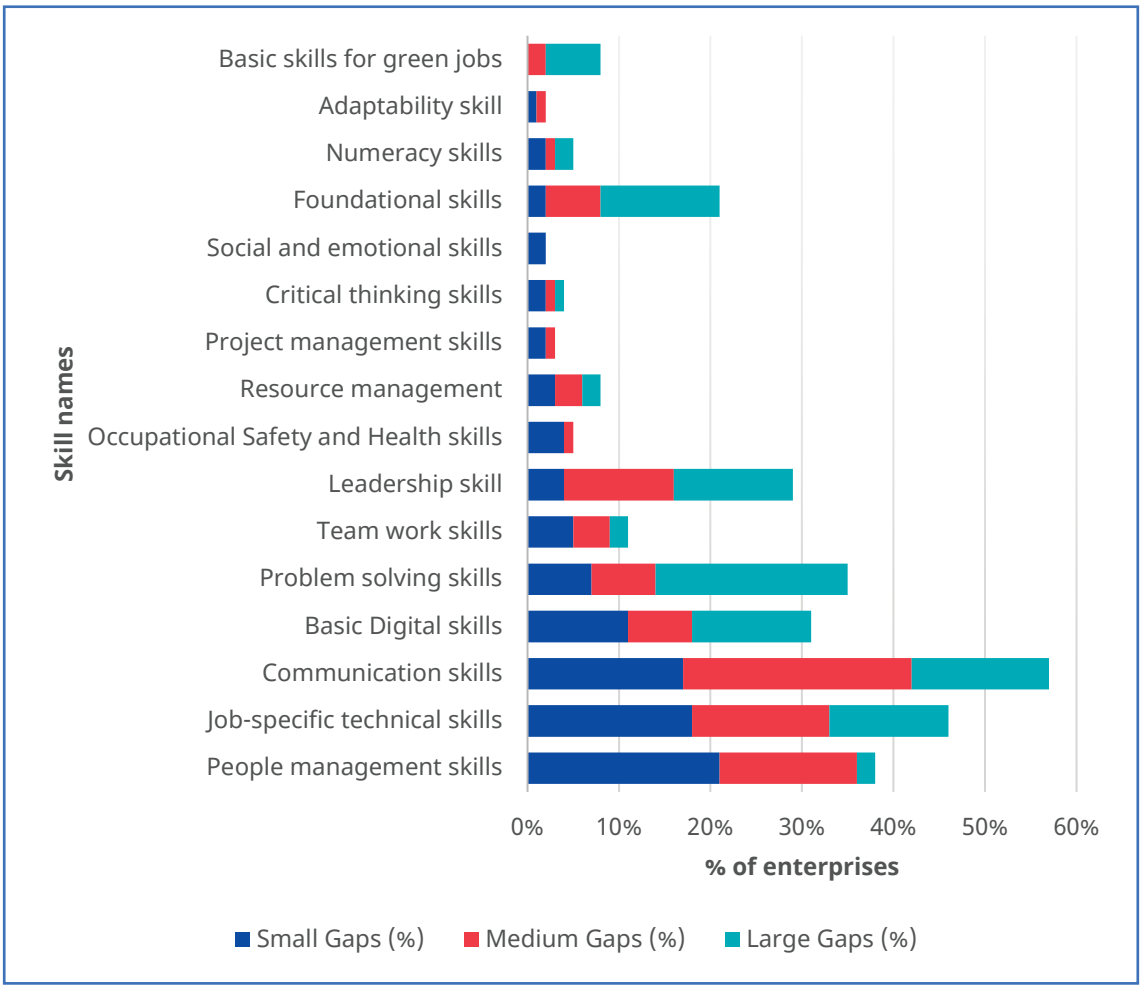
Note: More than one response possible. Source: ESS 2023.

▶ 3.4. Current workforce and skills

Figure 38 presents enterprises' assessment of various skills gaps within the sector. People management skill was the most commonly reported skill gap in the sector (in total 38 per cent of enterprises), with a substantial portion of enterprises (17 per cent) reporting that these gaps are medium to large in nature. Job-specific technical skills were the second-most commonly reported skills gap in the sector (in total 46 per cent), with 28 per cent of enterprises being of the opinion that these gaps were medium or large. Communication clearly plays a vital role in the tourism and hospitality industry given that direct engagement with guests, diners and audiences is a key element of service provision and the customer experience. That communication and job-specific skills were the most cited skills gaps suggests that there is a lot of potential in pursuing training and development initiatives in this space to create a more

professional and welcoming tourism and hospitality sector. A number of the more commonly reported skills gaps have to do with management roles, including problem solving skills and leadership skills (both cited by a number of enterprises as areas with large gaps) and people management skills (the third-most commonly cited skill gap area, although it was usually cited as a small gap). This aligns with the STED Workshop finding noted about that it was difficult to find managers that were sufficiently skilled and experienced. Foundational skill areas such as numeracy, adaptability, and social and emotional skills were among the least cited gaps, suggesting that these areas are currently being met adequately within the workforce or by educational training programmes.

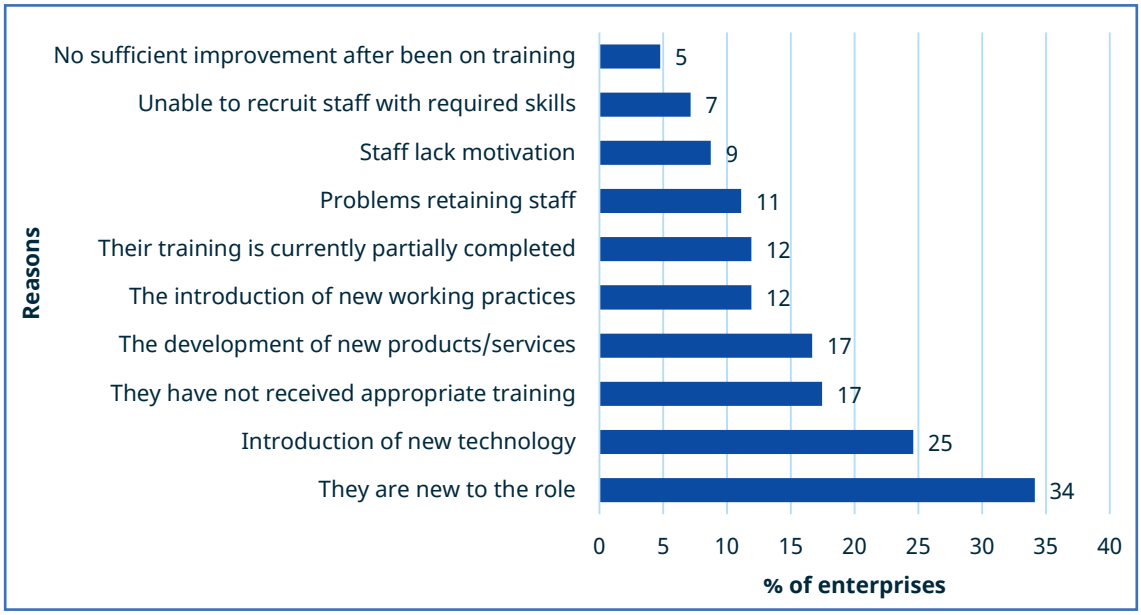
▶Figure 38. Skills gaps cited by tourism enterprises (% of respondents, N=126)



Note: Multiple responses possible. Source: ESS 2023.

Figure 39 illustrates the various reasons given by surveyed enterprises for any lack of full proficiency among their workers. Being new to the role was the most commonly reported reason (34 per cent), indicating that inexperience is a primary factor. The second-most commonly reported cause was the introduction of new technology (25 per cent), suggesting that technological advancements in the sector are contributing to proficiency gaps. Not receiving the appropriate training (17 per cent) and development of new products and services (17 per cent) were also cited by a number of enterprises, which emphasizes the role of training and of adaptation to innovation in worker proficiency. Collectively, these factors highlight the multifaceted challenges in developing a fully proficient workforce.

▶ Figure 39. Main causes of workers not being fully proficient, according to tourism enterprises (% of respondents, N=126)

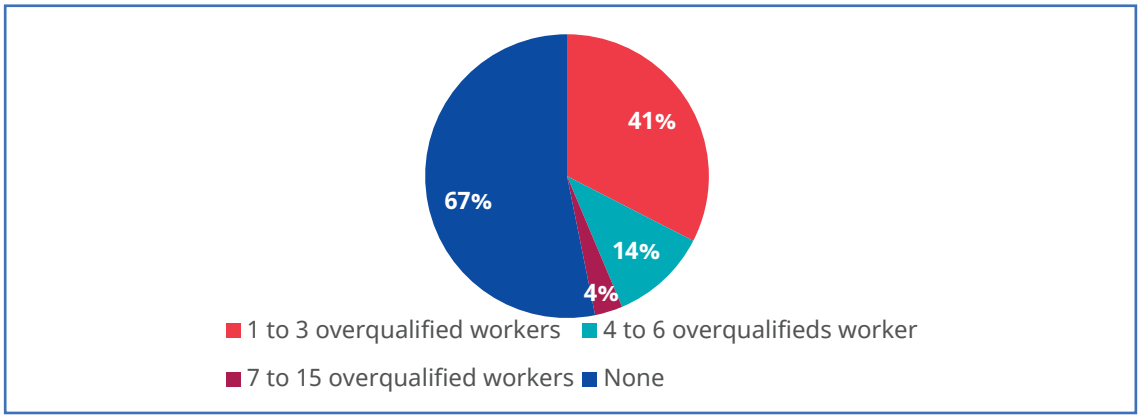


Note: Multiple responses possible. Source: ESS 2023.

3.4.1. Underutilization

The surveyed enterprises were asked about the number of workers they had who possess qualifications exceeding their job requirements. Slightly more than half of the enterprises (53 per cent) said that they have no overqualified workers. Roughly one-third of enterprises (33 per cent) reported having 1 to 3 overqualified workers, indicating that most of the enterprises with overqualified workers have very few employees who should be in a more advanced role based on their past experience or skill level. In general the share of enterprises with significant numbers of overqualified workers is rather small, with 11 per cent reporting 4 to 6 overqualified workers, and just 4 enterprises (3 per cent) report having 7 to 15 overqualified workers, with this latter figure indicating that it is quite uncommon to find large numbers of workers that are too advanced for their role within a single enterprise.

▶ Figure 40. Number of workers in surveyed enterprises with qualifications surpassing their job requirements (% of respondents, N=126)

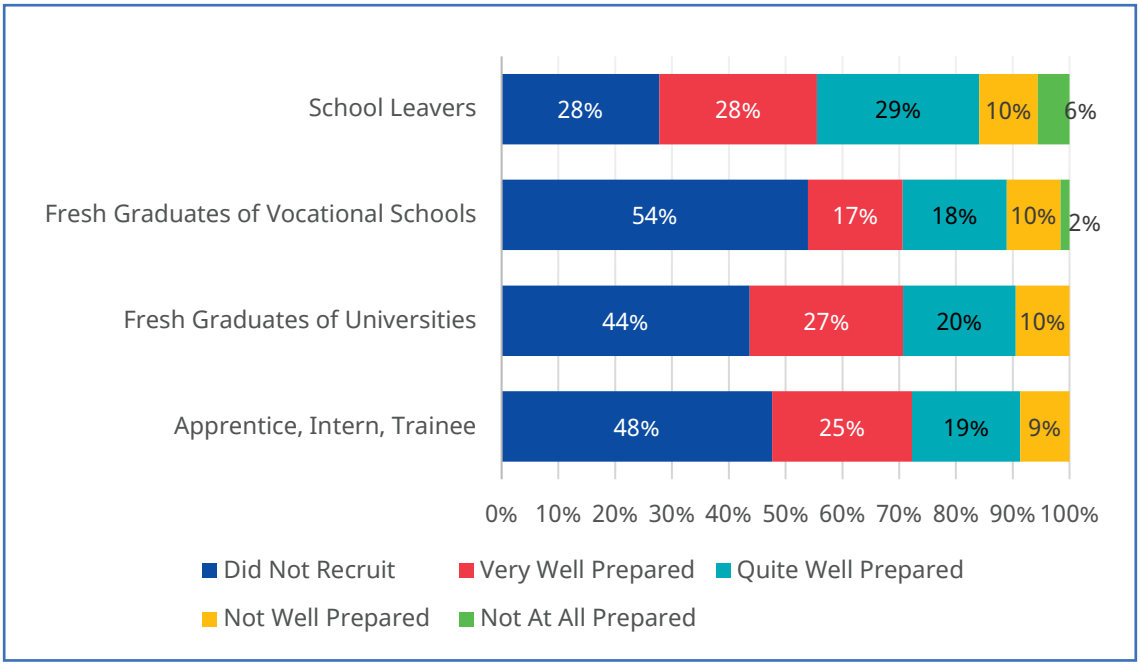


Source: ESS Survey 2023

3.4.2. New entrants

As with the construction sector above, enterprises in the tourism and hospitality sector were more likely to recruit school leavers than new TVET graduates, new university graduates or apprentices/trainees. In another parallel with the construction sector, school leavers were also given surprisingly high marks for preparedness despite having a lack of relevant training, which as noted above, is probably a reflection of a preference within the industry to train their own staff internally. However, school leavers were also the mostly likely to be cited as "not at all prepared", with the data suggesting that that workplace readiness is perceived to be higher among those with practical training (that is, apprentices/trainees) or a tertiary education. TVET graduates do not fair particularly well, however, with enterprises less likely to view them as being "very well prepared" or "quite well prepared", which is reflected in the fact that more than half of enterprises (54 per cent) have not recruited any new TVET graduates. This suggests a need to revise curricula and training to better meet the needs of industry.

▶ Figure 41. Preparedness level of new entrants in their first jobs, by type of new entrant (% of respondents, N=126)

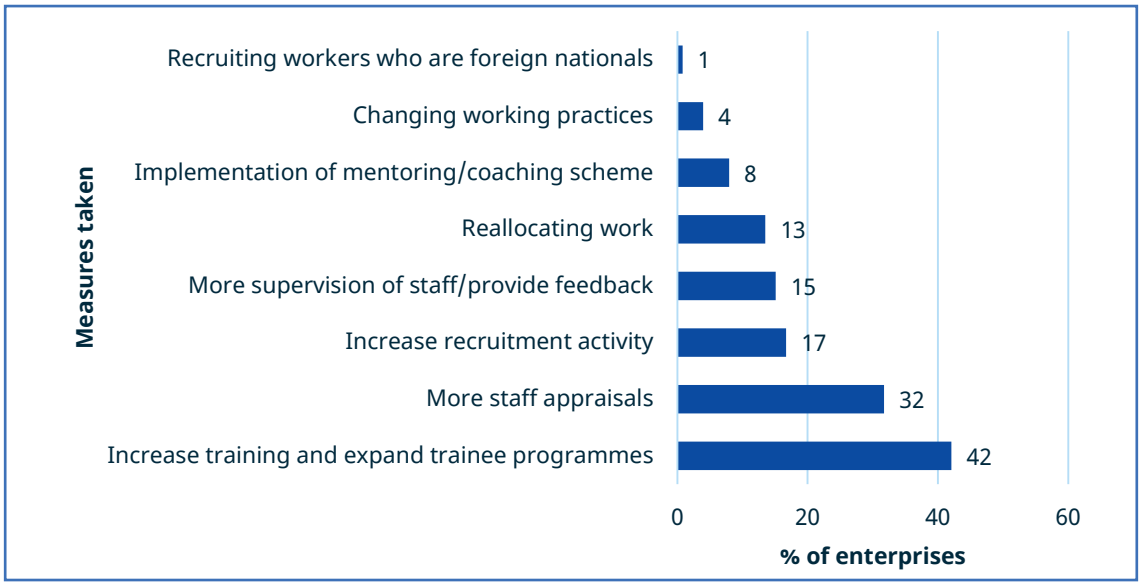


Source: ESS Survey 2023

▶ 3.5. Workforce development

Figure 42 illustrates the different strategies tourism and hospitality enterprises have employed to address the issue of employee proficiency. It is clear that the most favored approach is to increasing training and expand trainee programmes (reported by 42 per cent of enterprises), indicating a strong emphasis on enhancing skills through structured learning. This is followed by conducting more staff appraisals (32 per cent), suggesting that organizations also rely on performance evaluations to identify and possibly remedy proficiency gaps. Increasing recruitment activity (17 per cent) is also a notably taken measure, reflecting efforts to bring in new talent as a solution to proficiency challenges.

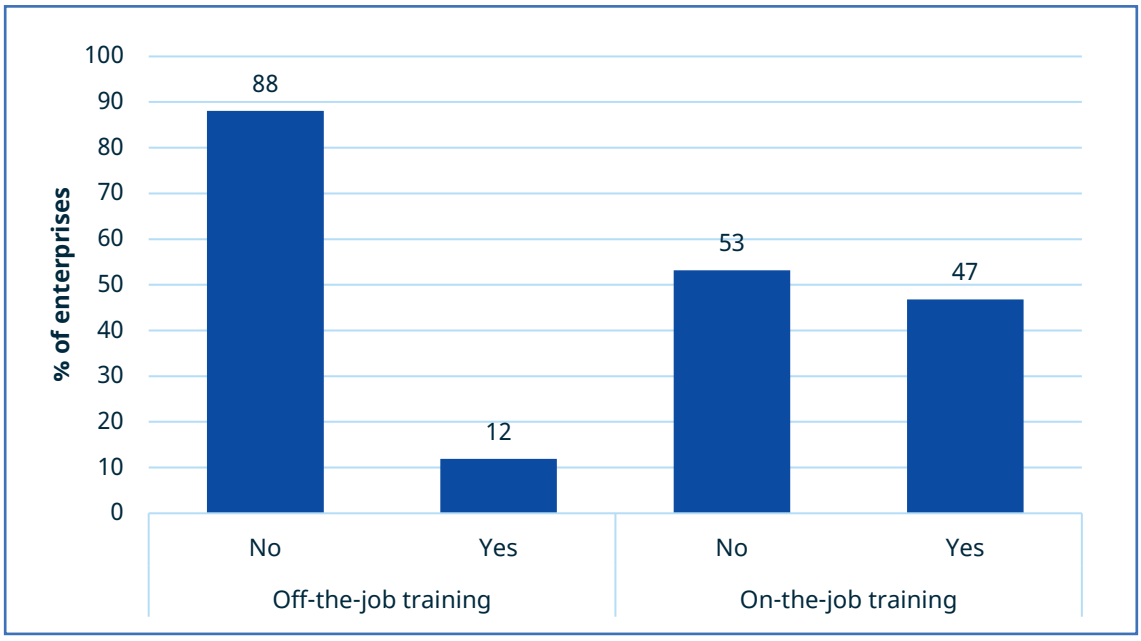
▶ Figure 42. Measures taken by the enterprises to overcome of challenges related to workers not being fully proficient (% of respondents, N=126)



Note: Multiple responses possible. Source: ESS Survey 2023

Figure 43 displays the share of enterprises that have supported two types of job training over the last 12 months: off-the-job training and on-the-job training. A striking 88 per cent of enterprises have not supported off-the-job training, which suggests a significant reliance on in-house or on-the-job methods rather than formal training programmes conducted outside the workplace. However, while support for on-the-job training is indeed much higher, it was still only utilized by less than half of respondents (47 per cent) in the previous year.

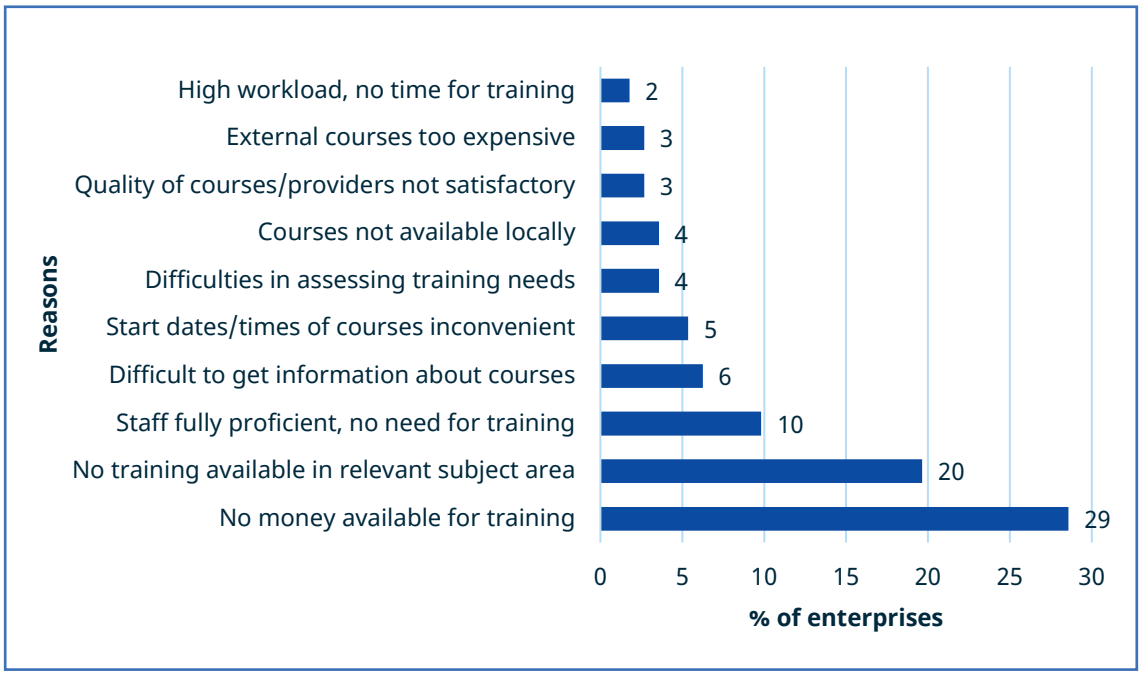
▶Figure 43. Enterprises' support for job training in last 12 months (% of respondents, N=126)



Source: ESS 2023.

Figure 44 outlines various reasons why organizations have not provided or funded education or training. The leading reason, cited by 29 per cent of respondents, is "no money available for training", followed by 20 per cent of respondents reporting "no training available in relevant subject area". About 10 per cent of respondents believed that all of their staff are fully proficient, and that there is consequently no need for training.

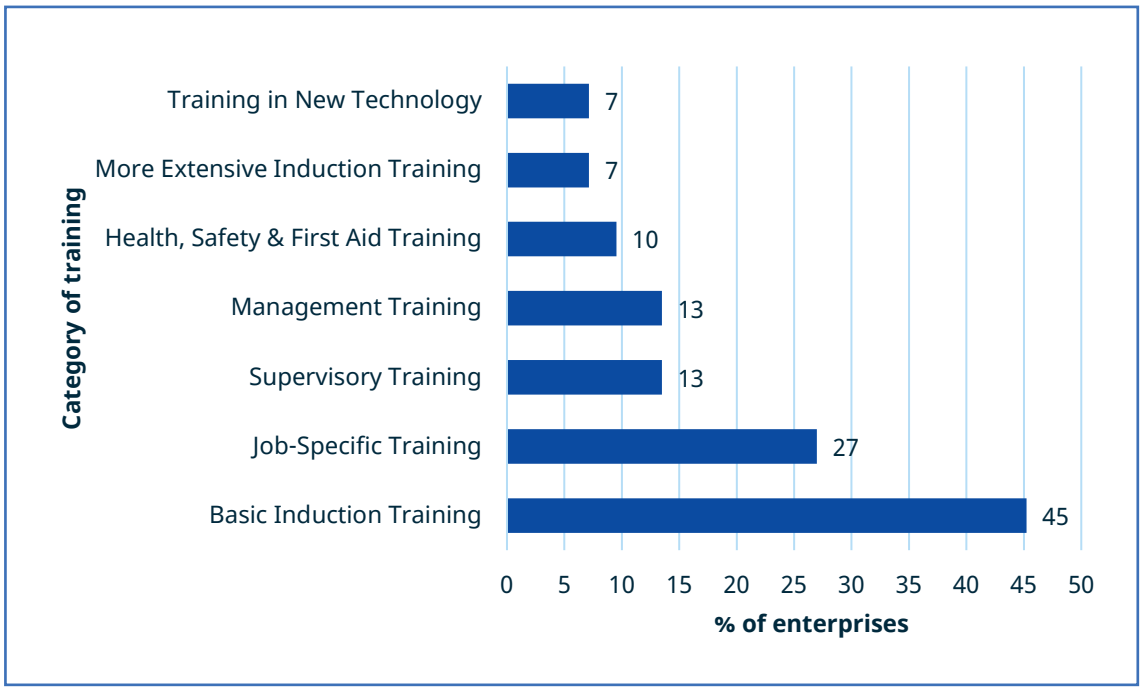
▶ Figure 44. Tourism enterprises' reasons for not providing/funding education or training (% of respondents, N=126)



Source: ESS 2023.

Figure 45 displays the types of training arranged by tourism and hospitality enterprises. Basic induction training was the most frequently arranged type, with 45 per cent of enterprises stating that they provide such training, suggesting a strong focus on foundational training for new employees. Job-specific training was the second-most commonly reported, at about 27 per cent, indicating that many organizations prioritize role-specific skills development. Supervisory training and management training are also key areas, with each offered by 13 per cent of enterprises, showing at least some investment in leadership and administrative skill development in the sector. Health, safety and first aid training was cited by 10 per cent of enterprises, reflecting a commitment among these enterprises to workplace safety and emergency preparedness.

▶Figure 45. Types of training arranged by tourism enterprises (% of respondents, N=126)

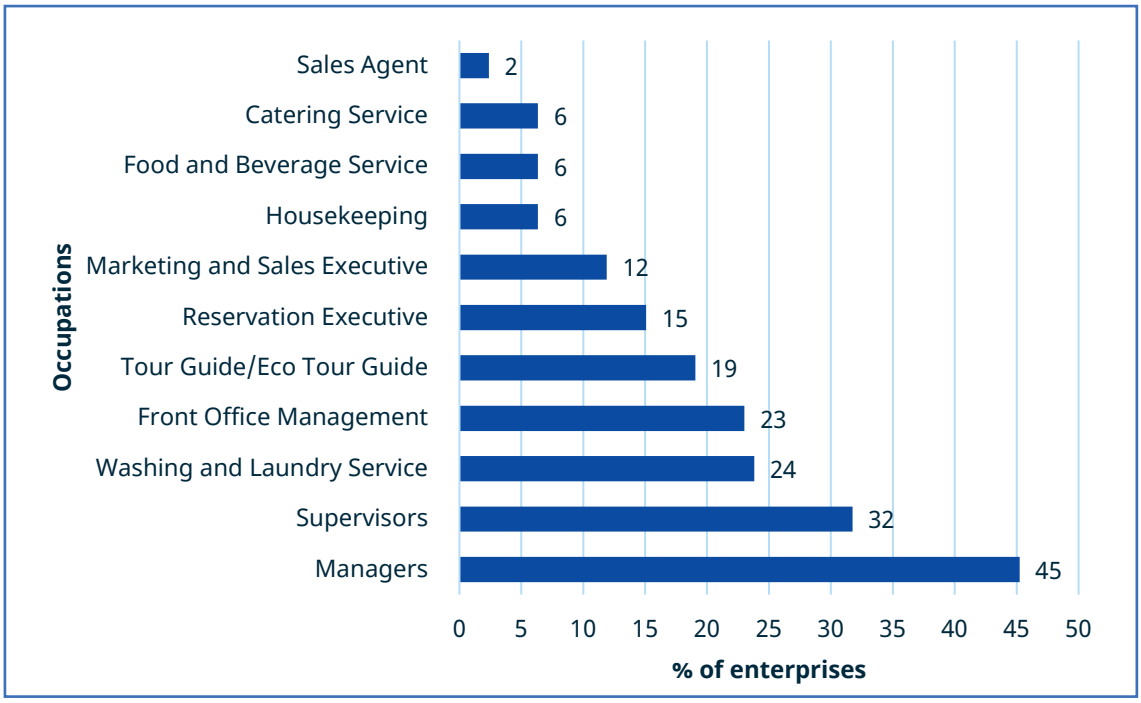


Source: ESS survey 2023

▶ 3.6. Future labour and skills demand

Figure 46 illustrates the occupations that the surveyed tourism and hospitality enterprises believe will be in demand in the future. Managers and Supervisors were the two most commonly cited roles, at 45 per cent and 32 per cent of enterprises, respectively, which underscores the significant need for leadership and organizational roles in the sector. Lagging well behind the top two occupations, Washing and Laundry Service and Front Office Management were cited by 24 per cent and 23 percent of enterprises, respectively, indicating these roles will be moderately sought after in the future.

▶ Figure 46. Occupations that will be in demand in the future, according to tourism enterprises (% of respondents, N=126)

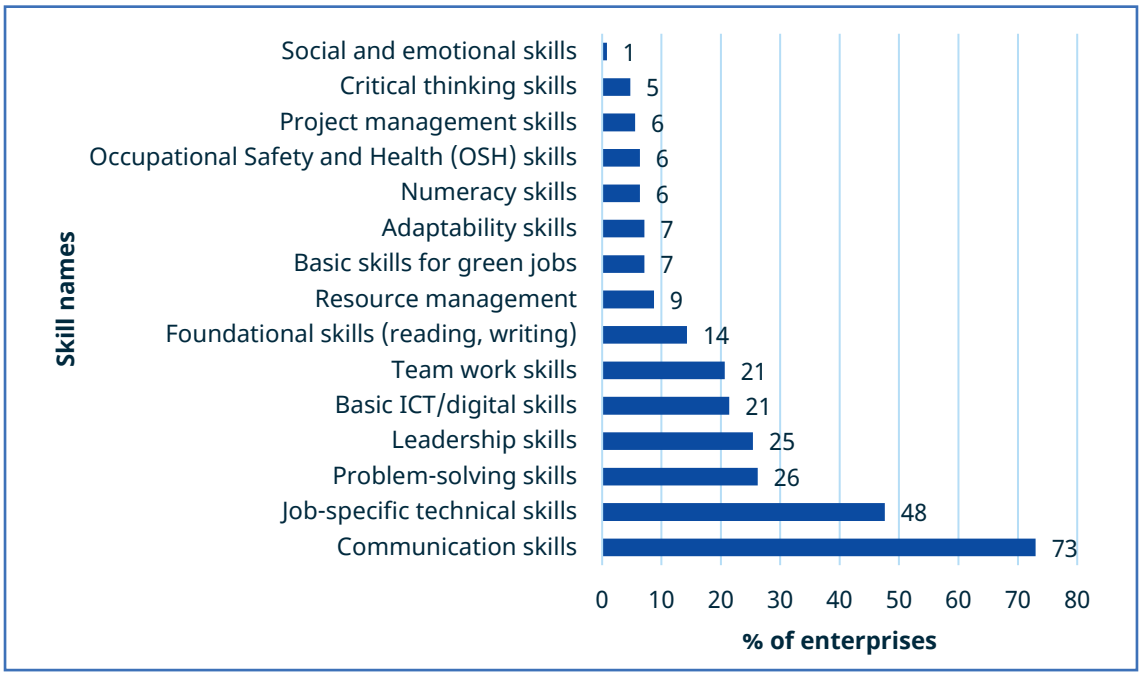


Note: Multiple responses possible. Source: ESS 2023.

Figure 47 presents the skills that are anticipated to be in demand in the future, according to the surveyed enterprises. At the top of the demand list by a wide margin are communication skills and job-specific technical skills, which were cited by 73 per cent and 48 per cent of respondents, respectively. These were also the two areas that enterprises were most likely to report skills gaps (figure 38), which suggests that enterprises believe that these gaps will persist for at least the foreseeable future.

Though far less likely to be cited than the top two skills, problem-solving skills and leadership skills, basic ICT/digital skills and team work skills are also anticipated to be highly valued in the future, with 26 per cent, 25 per cent, and 21 per cent of enterprises, respectively, selecting them, which reflects the growing sense in the sector of the need for technical proficiency in an increasingly digital workplace. Foundational skills follow at 14 per cent of respondents, underscoring the importance of basic skills and capabilities in future roles.

▶ Figure 47. Skills that will be in demand in the future, according to tourism and hospitality enterprises (% of respondents, N=126)



Source: ESS 2023.

▶ 3.7. Vision for the future of the sector

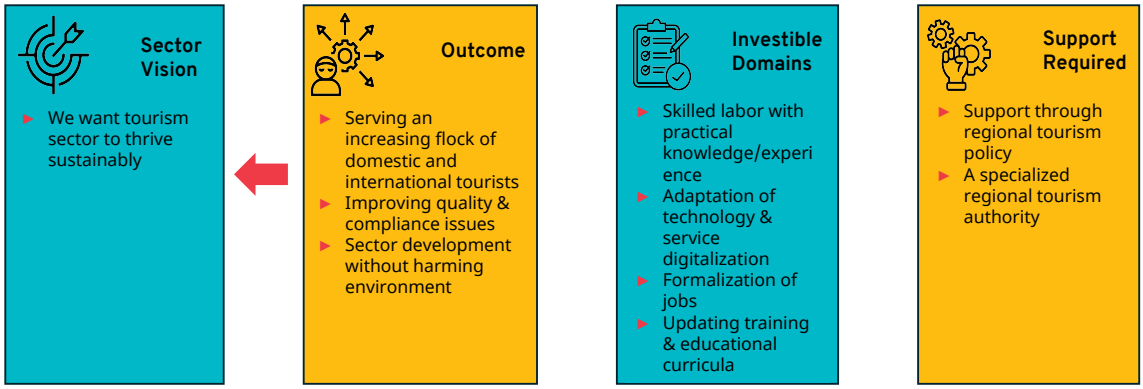
Bangladesh is on the verge of finalizing its tourism master plan, which will seek the goal of attracting 5.57 million foreign tourists annually by 2041 and fostering the creation of 21.94 million jobs within the sector (Siddiqui 2023). The Chattogram–Cox's Bazar region remains the top destination for both national and international tourists. In addition, the Government is pursuing a number of major tourism and hospitality-related projects, such as the internationalization of the Cox's Bazar airport, the finalization of the Dhaka to Cox's Bazar railway, and the construction of three ecotourism parks at Sabrang, Naf and Sonadia in order to attract foreign investment to Cox's Bazar (Kashem 2021).

Against this backdrop, tourism industry stakeholders expressed their vision for the sector at the STED Workshop, while also stressing different areas where there are business gaps. The workshop participants also focused on the need for support from the Government. The vision statement crafted by tourism stakeholders at the STED Workshop is provided immediately below:

- *We envision a future where the tourism and hospitality sector flourishes sustainably, catering to an ever-growing number of both domestic and international tourists. We are committed to not only elevating the quality of services, but also addressing compliance challenges, all while preserving the environment.*
- *The heart of our vision lies in skilled labour, equipped with hands-on knowledge and experience. Embracing technology is paramount; we aim for seamless digitalization of services, job formalization, and an ever-evolving training and educational framework.*

- *To make this vision a reality, we seek robust government support, specifically through a cohesive regional tourism policy and the establishment of a dedicated regional tourism authority. We want to shape a future where tourism is both a joy for visitors and a sustainable pillar of the economy.*

▶Figure 48. Vision of tourism's future in Bangladesh



▶ 3.8. Gaps in the capabilities and skills needed to achieve the vision for the future

Key business gaps in the tourism and hospitality sector

Despite being a tourism hotspot, tourism enterprises in the region – especially in Cox's Bazar – lack capacity in many respects. The tourism and hospitality sector in Cox's Bazar faces many challenges and gaps that need to be addressed to ensure its sustainability and competitiveness. The vision that the sector desires to achieve will not be reachable if those capability gaps cannot be filled.

Sales and marketing

This gap refers to the lack of skills and knowledge to promote and sell tourism products and services to customers. Sales and marketing involve identifying and targeting potential and existing customers, communicating and delivering value propositions, and persuading and influencing purchase decisions. Tourism enterprises in the region are still lagging behind in utilizing digital marketing, social media marketing, search engine optimization (SEO), and so on. To keep up with the pace of changing trends in the tourism and hospitality sector, digital marketing is the key now. One participant in the STED Workshop stated that apart from a few large enterprises, most of the SMEs in the sector barely utilize digital and IT-based marketing.

Implementation of policies and lack of quality services

The tourism and hospitality sector needs to implement policies, such as rules, regulations and standards that guide the operations and activities of tourism enterprises. At present, there is a lack of implementation of policies in the tourism and hospitality sector, due to low levels of coordination, monitoring and enforcement. This gap leads to inconsistency and inefficiency in tourism and hospitality sector enterprises. According to a STED Workshop participant, the quality of service has a massive impact on "invisible tourism", that is, on unplanned growth of the sector that has been led by quality service being blended into the sector. In every segment of the tourism and hospitality sector in Cox's Bazar there is a lack of quality services, which hampers fulfillment of the invisible capabilities of the sector.

Environmental management

According to the participants of the STED Workshop, ecotourism is the key to a sustainable tourism and hospitality sector. However, tourism enterprises in the Chattogram–Cox's Bazar still lack adequate knowledge of environmental management and capacity to manage their businesses in an environment-friendly manner. Sector stakeholders emphasized the need to reduce the environmental impacts of tourism activities in regard to energy consumption, water usage, waste generation and so on. At present, tourism businesses find it difficult to manage energy and waste.

Business innovation

Appropriate product and service design still remain a major business capability gap for enterprises in the tourism and hospitality sector. This also indicates the inefficiency of the enterprises in designing innovative products and services. Participants in the STED Workshop stated that village tourism, community-based tourism, and forest tourism have huge potential in the Chattogram–Cox's Bazar region, but enterprises have substantial knowledge gaps in designing such products and services.

Safety and security of tourists and female workers

Tourism enterprises in the region lack the knowledge and capacity to ensure the safety and security of tourists as well as their own female workforce, such as protection from accidents, crime, harassment and discrimination. Participants at the STED Workshop identified the safety and security of the female workers as one of the major contributors to the low participation of women in this sector.

Tourist behaviour analysis

Cox's Bazar hosts millions of tourists all across the year, but there is a lack of tourist behaviour analysis in sector, due to low levels of research, analysis and segmentation. This can lead to misunderstandings concerning visitors' wants and demands, which can affect the attraction and retention of tourists.

Technology usage

While other countries are already successfully integrating artificial intelligence technology into their tourism and hospitality sectors, enterprises in the Chattogram–Cox's Bazar region struggle to integrate basic digital technology. STED Workshop participants mentioned that they are still not utilizing basic technologies, such as mobile apps, simulations and technology-based amusement parks. This is largely happening due to technological skills gaps.

Human resource management

There is an overall capacity gap in the human resource management of business enterprises. From employee recruitment to termination, enterprises tend to avoid even basic human resource management practices. For example, the absence of job formalization is a long enduring malpractice of this sector, leading to employee inefficiency and insecurity. It was found during the STED Workshop that tourism enterprises do not even know that there is a formal means of skills certification managed by the Bangladesh Government and that TVET providers are a major source of workforce supply.

▶ 3.9. Skills implications for key business capability gaps

▶ Table 11. Skills needed to address major business capability gaps in the tourism and hospitality sector

Gaps	Skills needed to address gaps	Related occupations
Sales and marketing	▶ Skills on digital marketing and content creation ▶ Skills on innovative marketing ▶ Skills on customer service ▶ Skills on branding	Inadequately available
Implementation of policies and lack of quality services	▶ Skill training on compliance issues related to Drivers, Helpers, Chefs, Front Desk Officers and Managers ▶ Skills on guest handling and etiquette for Front Desk Officers, Housekeepers ▶ Skills on communication for Front Desk Officers, Housekeepers	Inadequately available
Environmental management	▶ Skills on environmental compliance ▶ Skills on ecotourism ▶ Skill on waste management ▶ Skills on renewable energy usage and maintenance	Adequately available
Business innovation	▶ Skills on environmental compliance ▶ Skills on ecotourism ▶ Skill on waste management ▶ Skills on renewable energy usage and maintenance	Adequately available
Safety and security of tourists as well as female workforce	▶ Skills on fire incident management ▶ Skills on first aid ▶ Skill on problem-solving	Adequately available
Tourist behaviour analysis	▶ Skills on tourist data preservation ▶ Skills on tourist behaviour analysis ▶ Skills on analysing tourists' changing mindsets	Not available
Technology usage	▶ Skills on website management and mobile application development ▶ Skills on updated payment	Not available
Human resource management	▶ Skills on human resource planning ▶ Skills on recruitment ▶ Skills on career counselling	Not available

Concerning key business capability gaps, the STED Workshop participants identified some skills implications that the industry is suffering from. For example, for sales and marketing, they need employees skilled in digital marketing. The industry also has a strong tendency to not align with policies, which stakeholders identified as being due to a need for training on compliance issues for Helpers and Drivers. According to the stakeholders, training on food and beverage quality assurance is needed for Chefs in restaurants and street vendors, and skills development related to guest handling and professional etiquette is needed for Front Desk Officers, Housekeepers, and others. The STED Workshop participants also stressed the need for skills development related to environmental management, business innovation, tourist behaviour analysis, technological usage, safety and security, and human resource management.

▶ 3.10. Skills supply findings

3.10.1. Supply of skills

One of the major objectives of the study was to determine the available skills programmes and training available in the Chattogram–Cox's Bazar region. Table 11 below gives an overview of the key tourism and hospitality-related skills training programmes available in the region by certification level.

▶ Table 12. Available tourism and hospitality sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level

Certification level	Trade/specialization programmes available	
	Chattogram region	Cox's Bazar
Diploma	Tourism and Hospitality	Tourism and Hospitality*
NSC (Levels 1–5)	Baking and Cooking Food and Beverage Servicing Housekeeping Tour Operation	Food and Beverage Food and Beverage Servicing Front Office Management Housekeeping
Informal certificate course	Air Ticketing Professional Course Baking Baking and Cooking Cooking Cooking and Catering Food and Beverage Food and Beverage Production Food Preparation and Culinary Front Office Management Hotel Management Housekeeping Professional Chef Course Sugar Art	Food and Beverage Front Office Management Hotel Management and Hospitality Housekeeping Tour Guiding Tour Operation Youth Kitchen

*This diploma programme was available at one TVET provider in Cox's Bazar at the time of the survey, and is therefore included in the data for this chapter. However, it was subsequently discovered that the decision had been made by that provider to stop offering the course due to lack of demand.

At the diploma level, only one BTEB-accredited tourism and hospitality-related programme available – a Diploma in Tourism and Hospitality. At the time of the survey, Cox's Bazar Polytechnic was the only surveyed institution in Cox's Bazar that offered this diploma programme, but the programme has since been discontinued due to a lack of students, according to a conversation with the institution head. No tourism and hospitality-related SSC and HSC programmes are available in either the Chattogram region or Cox's Bazar. However, there are a few NSC courses available, such as housekeeping, front office management, tour guide and so on.

While there are ultimately rather few formal training programme offerings related to the tourism and hospitality sector, there are quite a lot of informal courses available, although these too are more limited in Cox's Bazar. From interviews with the stakeholders, the study team also found that few TVET providers are running tourism and hospitality-related courses commercially, but none of these programmes have BTEB accreditation.

3.10.2. Typical career pathways within the sector

Career pathways in the tourism and hospitality sector depend on the level of education a person has attained. Table 12 below shows the typical career pathways in the tourism and hospitality sector based on the individual's level of education.

▶ Table 13. Typical career pathways in the tourism and hospitality sector, by TVET programme certification level

Level of education	Career pathway
Diploma	A diploma holder in this sector can get into an entry-level managerial position in hotels, travel agencies, or restaurants, such as an admin officer, tour operation executive, and junior cook.
SSC (Voc) and HSC (Voc)	Currently, no courses are available at the SSC and HSC levels.
National Skills Certificate	NSC holders can start a career as a front desk officer, tour guide, or floor supervisor in a hotel, or as an assistant to the chef in a kitchen. Higher level courses allow graduates to earn a promotion or to jump into managerial roles.
Informal certificate course	People usually attend these courses to get the basic idea of a specialization. Sometimes, advanced courses are also available for a few specializations. Both formal and informal jobs may require an informal certificate. Informal jobs such as room services and waiters may require this type of certificate course. Formal jobs such as chefs, tour guides, and floor supervisors may also need this type of certification

Apart from formal and informal jobs, people also enter the sector via self-employment opportunities, such as roadside kitchens, street food carts, tour operation agencies and so on.

3.10.3. Types of TVET providers surveyed

Overall, of the 202 TVET providers surveyed in the Chattogram–Cox's Bazar region, just 29 stated that they provide tourism and hospitality-related training courses. Table 13 below shows the number of TVET providers providing training in tourism based on owner/operator of the provider.

▶ Table 14. Number of surveyed TVET providers offering tourism and hospitality-related courses, by owner/operator of the TVET provider

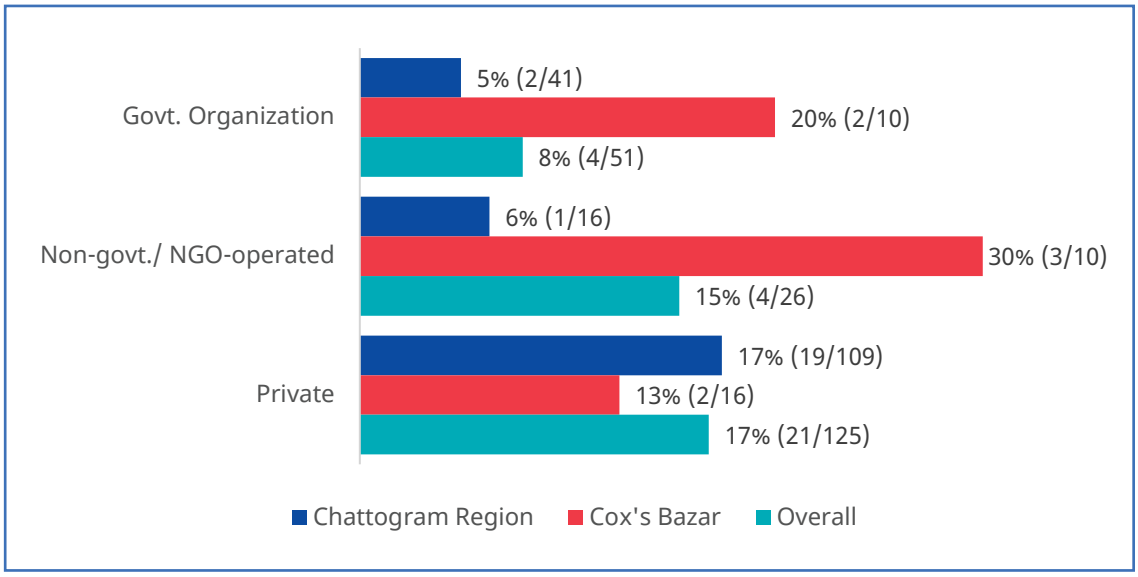
Region	No. of TVET providers surveyed	No. of TVET providers with tourism and hospitality-related courses
Chattogram region	166	22
▶ Government-operated	41	2
▶ Non-govt/NGO-operated	16	1
▶ Private	109	19
Cox's Bazar	36	7
▶ Government-operated	10	2
▶ Non-govt/NGO-operated	10	3
▶ Private	16	2

Source: Survey with TVET providers

Figure 49 below translates table 14 into percentage form, and shows that just 8 per cent of the government-run TVET providers surveyed offer tourism courses; while this is true for 15 per cent of NGO-run providers and 17 per cent of the private TVET providers. There is a lack of tourism courses in government-run providers is particularly acute in the Chattogram region, with only 5 per cent of surveyed providers offering tourism and hospitality-related courses, as opposed to 20 per cent inn Cox's Bazar.

As these figures suggest, there is a clear lack of skills supply in the tourism and hospitality sector in the Chattogram region and Cox's Bazar, despite them being tourism hotspots. According to KIIs and FGDs, a major reason for this lack of training courses is that local hotels often prefer to hire outsiders for formal jobs. Hence, local young people are not interested in getting any vocational or technical training for the tourism and hospitality sector, which in turn prompts local TVET providers to not offer tourism and hospitality-related courses. It was seen that many private TVET providers had previously attempted to offer tourism and hospitality-related courses, but had discontinued them due to a lack of demand, even though tourism is the largest industry in Cox's Bazar (BRAC 2021).

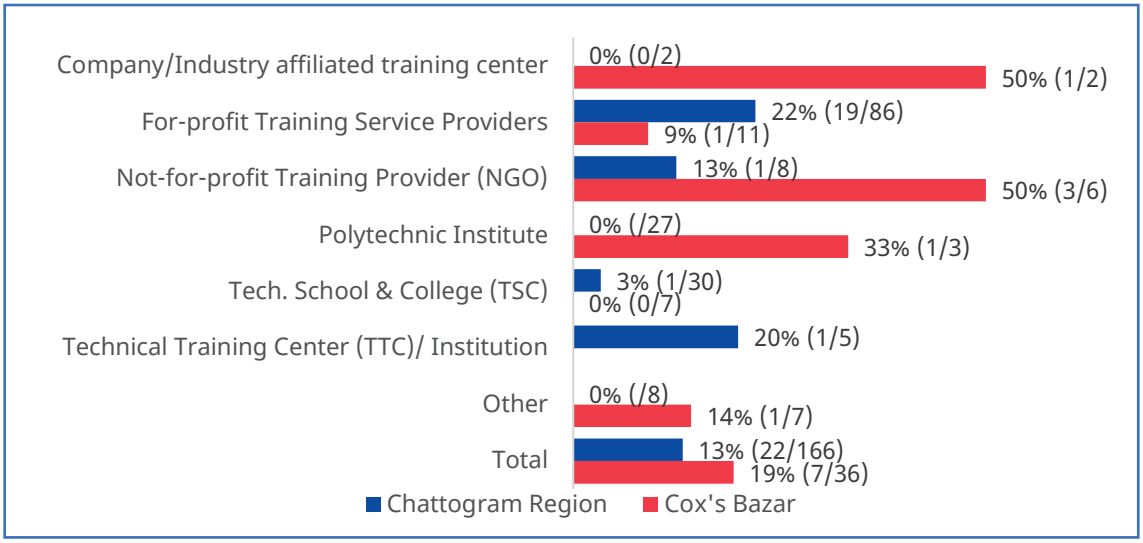
▶ Figure 49. Prevalence of tourism-related courses in surveyed TVET providers, by owner/ operator of the provider



Source: Survey of TVET providers.

Figure 50 shows the types of TVET providers in the region that are providing training related to the tourism and hospitality sector. From the figure, it is clearly visible that there is a relative absence of tourism and hospitality-related courses within most provider types. Among the surveyed TVET providers in the Chattogram region, tourism and hospitality-related courses were most likely to be offered by for-profit providers, but even here it was only true of 22 per cent of these providers. Indeed, for-profit providers were the only surveyed provider type in the Chattogram region where there was more than one provider offering tourism and hospitality-related courses. In Cox's Bazar there was a broader distribution of provider types offering tourism and hospitality-related courses, but it was typically only one provider per type. Only one for-profit TVET provider in Cox's Bazar offered tourism and hospitality-related course, as these enterprises generally did not find it commercially profitable to run courses in tourism. This lack of interest in commercial TVET programmes was further compounded by a few not-for-profit NGO-led training providers starting to offer tourism and hospitality-related courses with support from donor funds.

▶Figure 50. Prevalence of tourism-related courses in different types of TVET providers

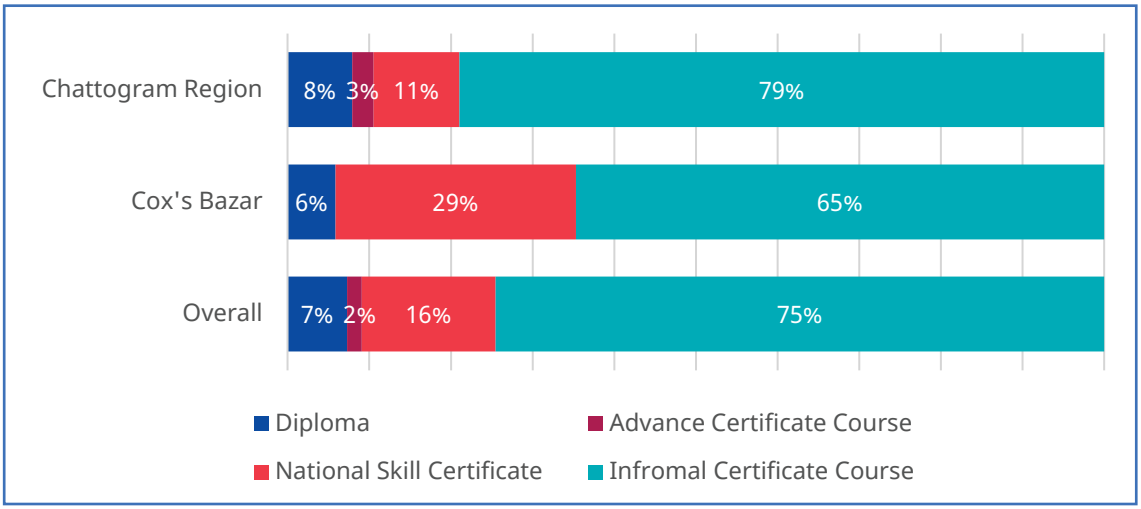


Source: Survey of TVET providers.

3.10.4. Level of skills programmes available

As figure 51 suggests, among the surveyed TVET providers, only a small proportion of tourism courses (7 per cent – or 2 courses) were being offered at the diploma level at the time of the survey[6]. Most of the tourism courses on offer (75 per cent) are from NGO-operated providers that award informal certificates. As noted above, there are no tourism and hospitality-related courses available at the SSC and HSC levels. Overall, 16 per cent of the courses are being offered under the NSC, though in Cox's Bazar this proportion jumps to 29 per cent. It should also be noted that, apart from TVET programmes, there are bachelor's and master's courses related to the tourism and hospitality sector available under the general education stream.

▶Figure 51. Level of the tourism and hospitality-related skills programme available (%)



Source: Survey of TVET providers.

6 As noted above, one of these course offerings – the one at Cox's Bazar Polytechnic – has since been discontinued due to lack of demand.

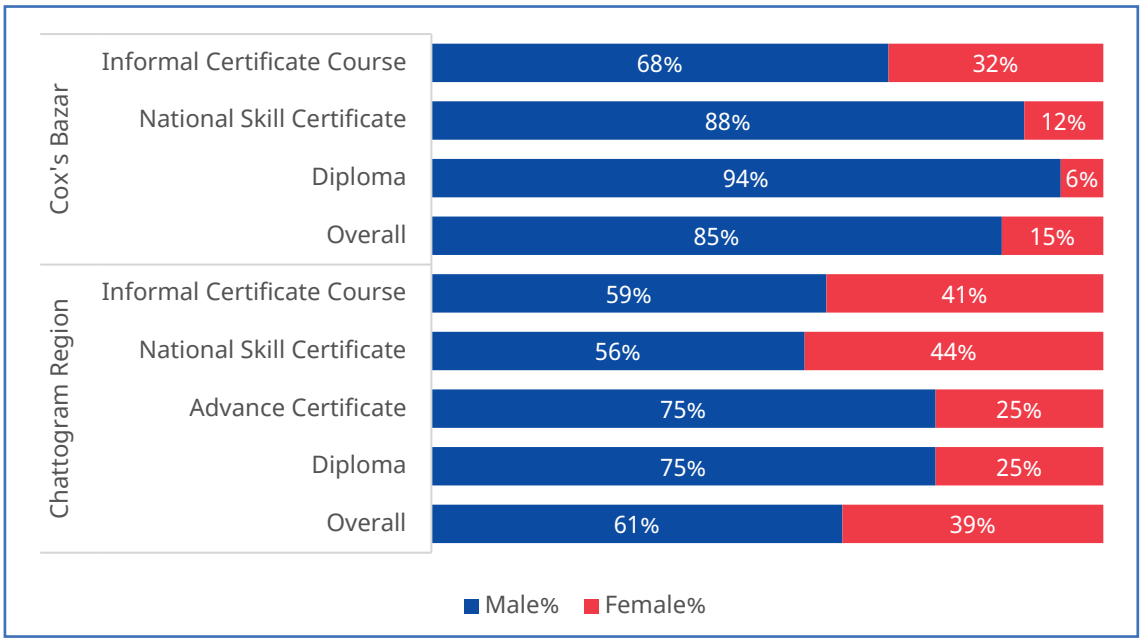
3.10.5. Qualifications relevant to the sector

For any entry-level managerial position in the tourism and hospitality sector, one may acquire a diploma certificate in tourism. HSC (Voc)/SSC (Voc) graduates can enter into positions such as Floor Supervisor in a hotel, assistant to the main chef in a restaurant, and similar. NSC-level graduates have the chance to enter sector-specific roles, such as Tour Guide or Reservation Officer. Graduates from informal courses typically earn the chance to enter the sector as a basic worker and start their career progression from scratch.

3.10.6. Enrolment status by sex

Figure 52 shows the ratio of male to female trainees currently enrolled in tourism and hospitality-related TVET courses. In the Chattogram region, the overall proportion of female trainees is around 40 per cent. But at the diploma level, only 25 per cent of the trainees are female. The ratio of female trainees is the highest in NSC programmes, at 44 per cent. Within courses that provide informal certification, female trainees account for 41 per cent of learners. However, the ratio of female participants in the Chattogram Hill Tracts is very low compared to what is found Chattogram district.

▶Figure 52. Ratio of male and female trainees enrolled in tourism-related courses (%)



Source: Survey of TVET providers.

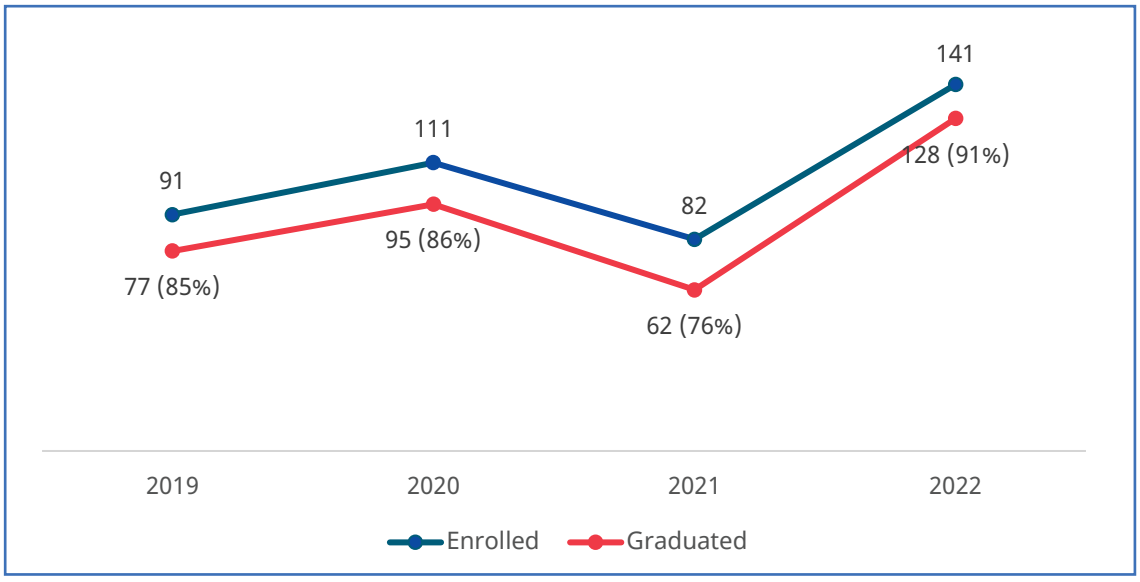
In Cox's Bazar, the female participation rate in tourism courses is lower than what is seen in the Chattogram region. Only 15 per cent of trainees enrolled in tourism and hospitality-related courses are female. Female participation is particularly low at the diploma level, where almost all of the trainees (94 per cent) are male. Female participation is highest in informal certificate courses, although it still only stands at 32 per cent. One of the main reasons for this relatively higher female participation rate in informal certificate courses is that a few of the NGOs offering tourism and hospitality-related courses in Cox's Bazar prioritize recruitment of female trainees to ensure female inclusion in skills training programmes. In the tourism and hospitality sector – especially in the accommodation subsector of Cox's Bazar – there is a notable absence of a female workers due to social barriers to such work, and this is also reflected in the participation of female trainees in tourism and hospitality-related courses.

3.10.7. Number of graduates

Concerning enrolment and graduation numbers in tourism and hospitality-related courses, an upward trend is observed in both Chattogram region and Cox's Bazar over the preceding few years. Figures 53 and 54 present the enrolment and graduation scenarios for HSC, SSC, and Dakhil (Voc) and 360 short courses offered in the Chattogram region and Cox's Bazar, respectively. The Chattogram region witnessed growth in both the number of enrolments and graduates in 2022 compared to 2019 – although there was a decline in enrolments and graduates in 2020 and 2021 due to COVID-19. In the Chattogram region, 141 trainees graduated in 2022, compared to 91 in 2019 – and graduation rates also improved over that time. Cox's Bazar also witnessed growth, with 52 trainees graduating from tourism and hospitality-related courses in 2022, compared to just 20 graduates in 2020.

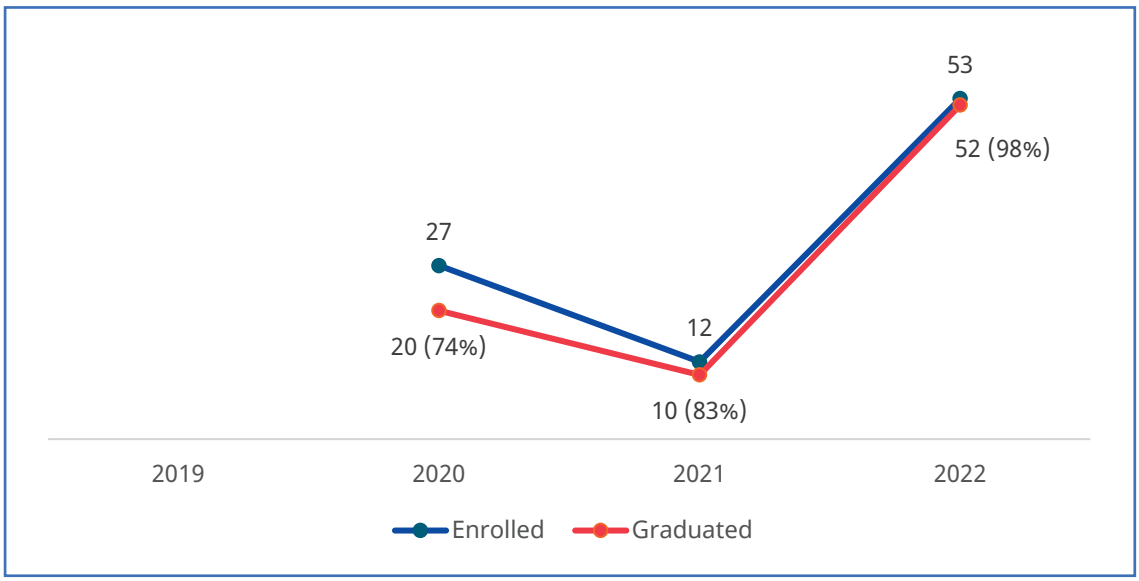
The data demonstrates that demand for tourism and hospitality-related TVET programmes remains limited, as overall enrolment numbers are still quite low, but that interest is growing, offering the potential to increase the training opportunities available. However, as mentioned earlier, Cox's Bazar has no courses related to tourism under at the SSC (Voc) and HSC (Voc) levels. From the STED Workshop, it was also observed that Cox's Bazar needs a more diverse selection of tourism and hospitality-related courses to cover more occupations within the sector. By incorporating such changes, more trainees would successfully enter the industry after graduation.

▶ Figure 53. Enrolment and graduation numbers for tourism related programmes in Chattogram, 2019–22



Source: Survey of TVET providers.

▶ Figure 54. Enrolment and graduation numbers for tourism and hospitality-related programmes in Cox's Bazar, 2020–22

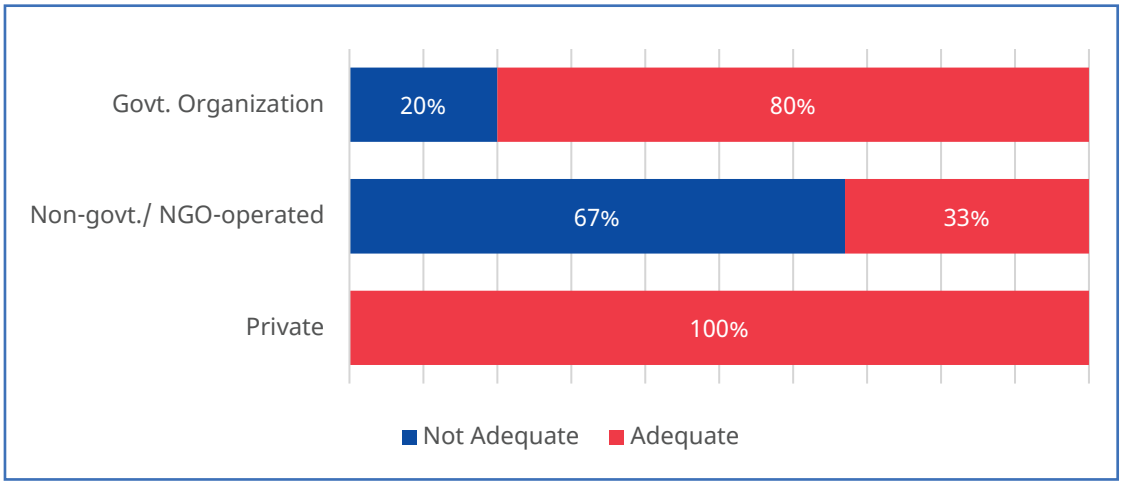


Source: Survey of TVET providers.

3.10.8. Adequacy of TVET providers' equipment

Figure 55 shows the status of the equipment used by TVET providers for tourism and hospitality-related courses in Cox's Bazar. Two out of the three NGO-operated TVET providers in Cox's Bazar reported that they do not have adequate equipment for their tourism courses. Because NGOs run courses using donor funding, they can only buy or outsource equipment on a need basis. As a result, they generally do not own their own equipment. On the other hand, government-run TVET providers typically reported that they possess the required equipment, with this being the case for 80 per cent of the government-run providers surveyed. Similarly, all of the private TVET providers said that they have adequate equipment for tourism and hospitality-related courses.

▶ Figure 55. Adequacy of training equipment in tourism and hospitality-related training programmes, by owner/operator of the provider (%)

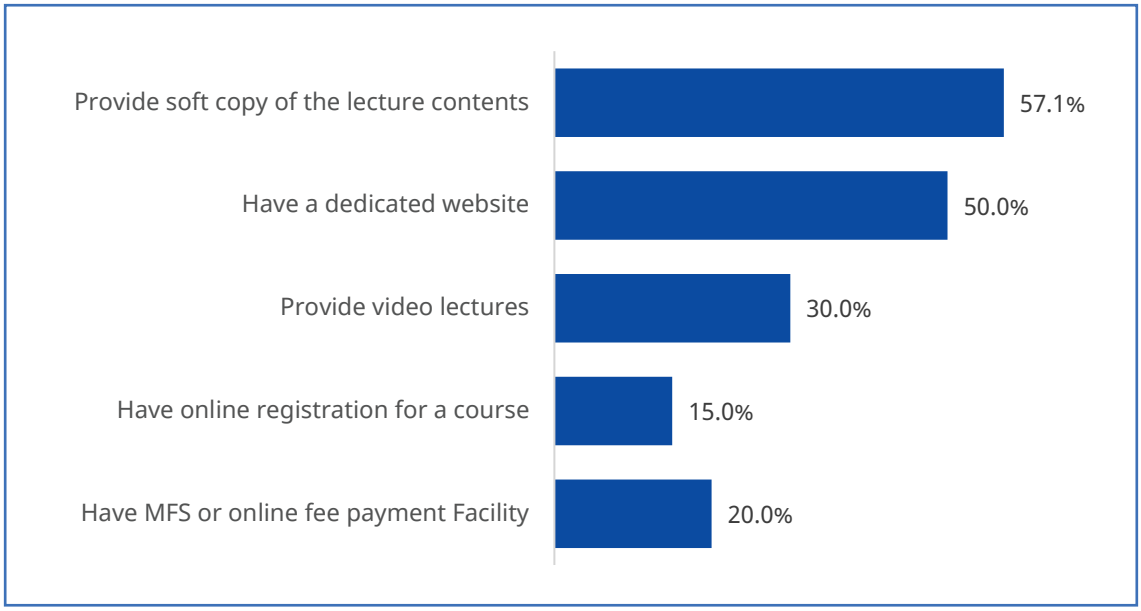


Source: Survey of TVET providers.

3.10.9. Digitization of TVET services

Since the emergence of the COVID-19 pandemic, digitization of services has become a major requirement for quality training. In the Chattogram–Cox's Bazar region, very few TVET providers offer digital services related to tourism courses. The most commonly cited digital services being providing are video lectures, having websites, providing soft copies of lectures, and having opportunities for online course registration. Only 30 per cent of the surveyed TVET providers facilitate video lectures, which here refer to Facebook Live videos and online classes delivered as video lectures. MFS – or online money transfer – has become a burning need for enterprises in every sector. Yet, in the Chattogram–Cox's Bazar region, only 20 per cent of TVET providers offering tourism courses can accept course fees via mobile banking or online banking. However, a few of the TVET providers surveyed did express an interest in adopting MFS or online banking for collecting course fees.

▶ Figure 56. Digitization status of TVET providers in regard to tourism and hospitality sector-related programmes (%)



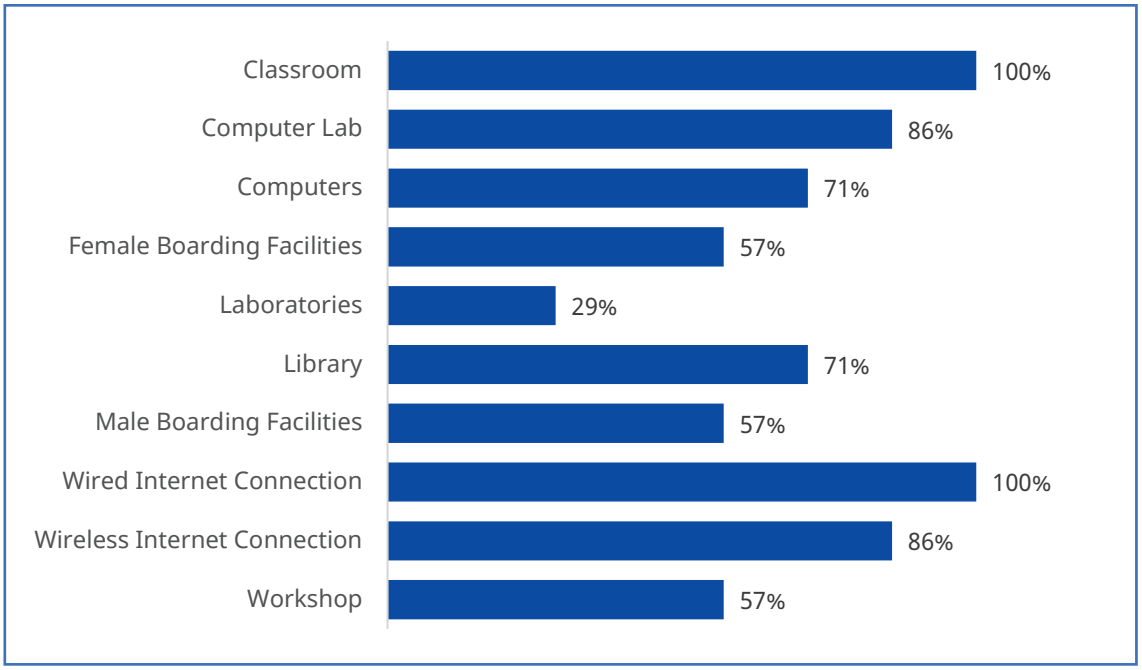
Source: Survey of TVET providers.

3.10.10. Status of facilities available at TVET providers

To ensure quality education and training, TVET providers must have at least a few basic facilities, such as proper classrooms, computers with internet access, and boarding facilities. Figure 57 presents some commonly required facilities for TVET providers and the prevalence of these facilities in the TVET providers offering tourism and hospitality-related training. All of the providers have a wired or wireless internet connection, and most also have computer labs, likely because they also offer ICT training courses. More importantly, 57 per cent of the TVET providers have boarding facilities for their trainees, both male and female. However, these boarding facilities are not dedicated only to tourism course trainees. Furthermore, most government-run TVET providers offer boarding facilities.

Most of the TVET providers raised concerns about the scarcity of their facilities. According to them, if they can expand their facilities, they can accommodate more trainees and provide higher quality training.

▶ Figure 57. Facilities available in TVET providers offering tourism and hospitality sector-related programmes (%)



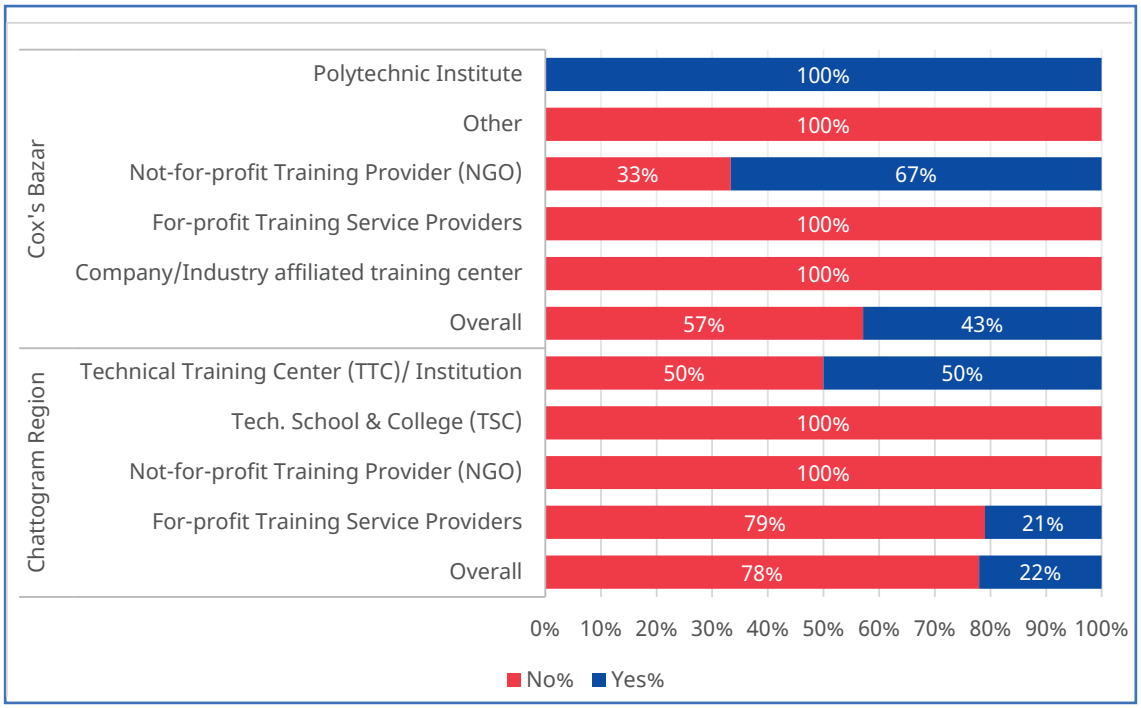
Source: Survey of TVET providers.

3.10.11. TVET providers' capacity to provide Recognition of Prior Learning

There are many people in the Chattogram–Cox's Bazar region who have worked in the tourism industry for a long time but do not have any formal certification of their skills. Figure 58 shows the proportion of TVET providers in the region that provide RPL for tourism and hospitality-related courses. In Cox's Bazar, two of the three NGO-operated TVET providers offer RPL, but they are effectively the surveyed providers to do so[7]. In the Chattogram region, 50 per cent of the TTCs offer RPL and 21 per cent of private TVET providers have the capacity to offer RPL. Otherwise, RPL was unavailable among the surveyed providers in the Chattogram region.

7 As can be seen in figure 58, Cox's Bazar Polytechnic also offered RPL at the time of the survey for their diploma programme, but that course has since been discontinued (see section 3.10.1).

▶ Figure 58. Status of tourism and hospitality-related RPL offerings in TVET providers, by type of provider (%)

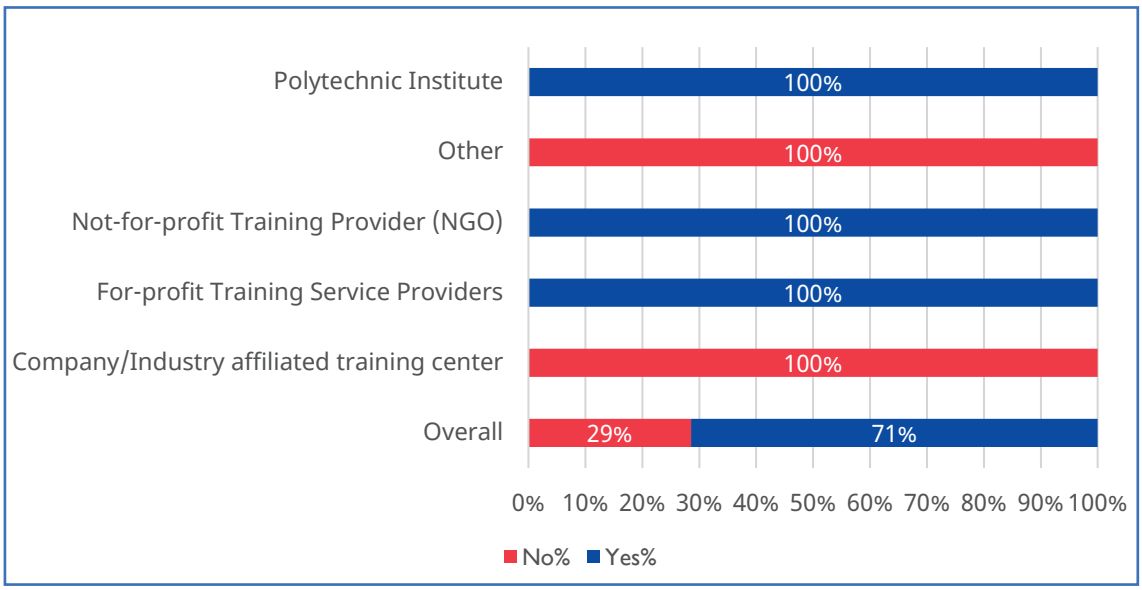


Source: Survey of TVET providers.

3.10.12. TVET provider collaborations/linkages with CBOs, NGOs and social organizations

The sustainability of a TVET provider largely depends on its understanding of and collaboration with society and community-based organizations. Overall, most of the TVET providers (71 per cent) in the Chattogram–Cox's Bazar region offering tourism courses said that they have some kind of linkage or collaboration with different types of CBOs, NGOs and social organizations, with this being the case for all (100 per cent) of the not-for-profit TVET providers.

▶ Figure 59. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on tourism and hospitality-related programmes (%)



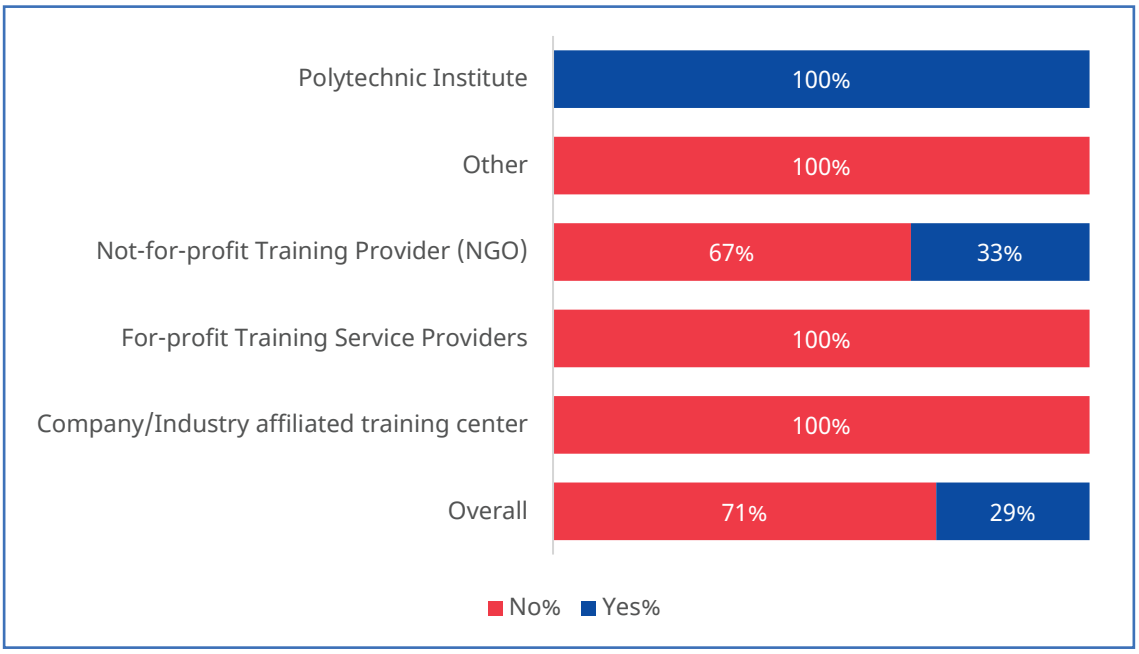
Source: Survey of TVET providers.

3.10.13. Share of TVET providers with placement cells for graduates

Placement cells work as an intermediary for graduates to engage with the industry related to their course of study, including to find employment. In the Chattogram–Cox's Bazar region, 29 per cent of the TVET providers offering tourism and hospitality-related courses reported having a functional placement cell for graduates. The one polytechnic institute offering a tourism course reported having a placement cell graduates, which is actually a requirement for a government-run polytechnic[8]. Beyond that, one-third (33 per cent) of the NGO-operated TVET providers have placement cells, with these generally being in the larger providers of this type. No other provider types reported having a formal placement cell; however, many TVET providers do conduct placement activities informally through personal connections and long-standing relationships with employers.

8 As noted above, however, since the time of the survey this polytechnic has discontinued its tourism-related course (see section 3.10.1).

▶ Figure 60. Share of TVET providers offering tourism and hospitality-related programmes that have placement cells for graduates (%)

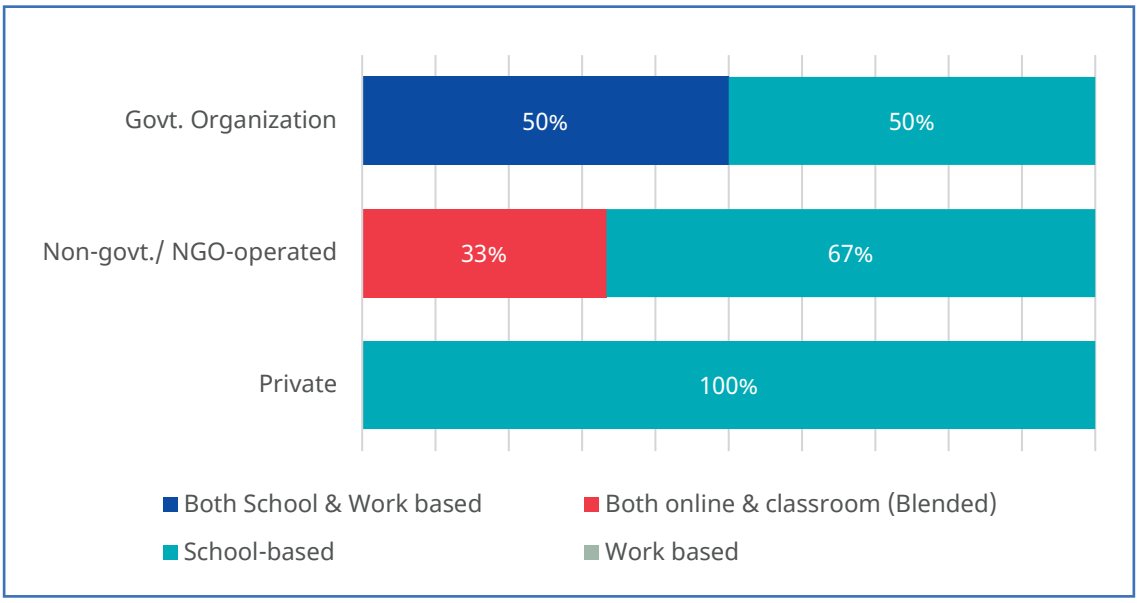


Source: Survey of TVET providers.

3.10.14. Course delivery mechanisms

TVET providers offering tourism courses typically follow a school-based approach to delivering their courses. All of the private TVET providers and two-thirds of the NGO-operated providers followed an exclusively school-based approach. The remaining third of NGO-operated providers said that they utilize a blended approach of online and classroom learning. All of government-run TVET providers offer classroom instruction, but half of them also incorporate work-based learning into their approach. Learning by doing is one of the most important aspects of technical education, but most of the providers offering tourism and hospitality-related courses do not get the chance or cannot create chances to incorporate a work-based approach into their courses.

▶ Figure 61. Course delivery method for tourism and hospitality sector-related TVET programmes, by owner/operator of the TVET provider

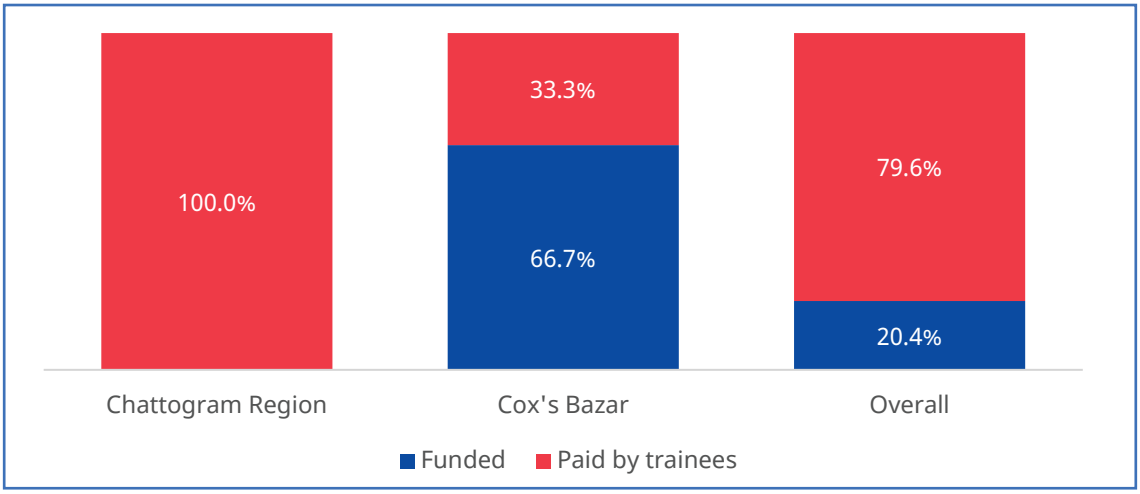


Source: Survey of TVET providers.

3.10.15. Source of tuition fees for courses

A majority of the tourism and hospitality-related courses in Cox's Bazar (66.7 per cent) are funded by donor organizations or the Government. It was found during field visits that at least four of the for-profit TVET providers in Cox's Bazar had actually discontinued offering courses in tourism because many donor- or government-funded courses flooded into the area, driving down demand for tuition-based courses. Conversely, all of the tourism courses in Chattogram region relied on tuition fees collected from the trainees. There are no donor- or government-funded courses available there. TVET providers during the STED Workshop raised a concern about the sustainability of tourism education in Cox's Bazar if courses continue to be offered free of cost to all cohorts of trainees.

▶Figure 62. Source of tuition fees for tourism and hospitality-related TVET programmes (%)



Source: Survey of TVET providers.

3.10.16. TVET providers' support services

The study sought to determine the various support services provided by TVET providers in the Chattogram–Cox's Bazar region. What follows is a brief overview of the support provided by TVET institutions that offer tourism and hospitality-related training courses:

Pre-training support

A minority of TVET providers reported offering pre-training support services, with the most common being vocational guidance, counseling with parents, and career counseling.

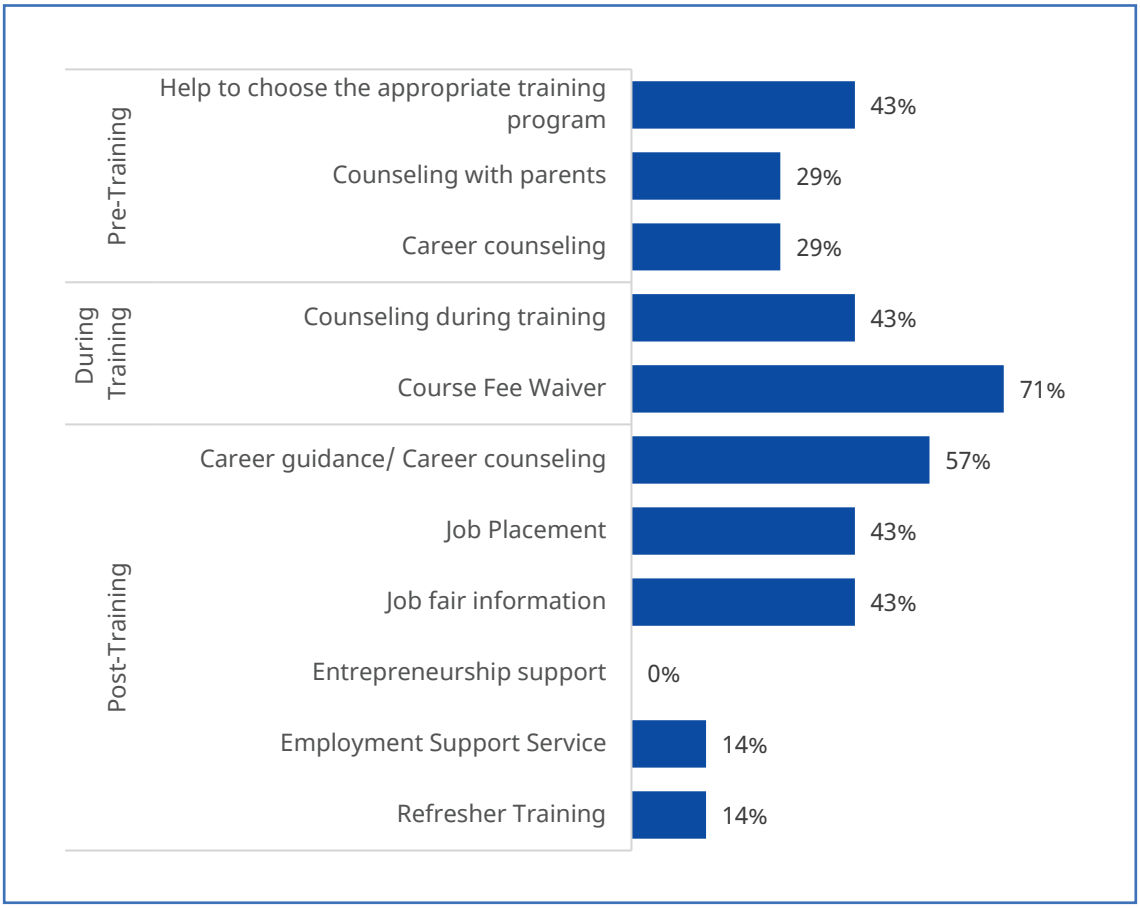
During training support

A total of 43 per cent of TVET providers offering tourism and hospitality-related courses provide counseling during training. Moreover, 71 per cent of providers said they consider course fee waivers for trainees, if needed. A few TVET providers also reported conducting motivational sessions and giving scholarships to trainees.

Post-training support

Career guidance was the most commonly reporting post-training support service (57 per cent). Some TVET providers also try to arrange job placements for graduates if any opportunities are available. Moreover, employment support services, the provision of job fair information, and refresher training were also reported by a handful of TVET providers.

▶ Figure 63. Support services provided available at TVET providers offering tourism and hospitality-related programmes (%)

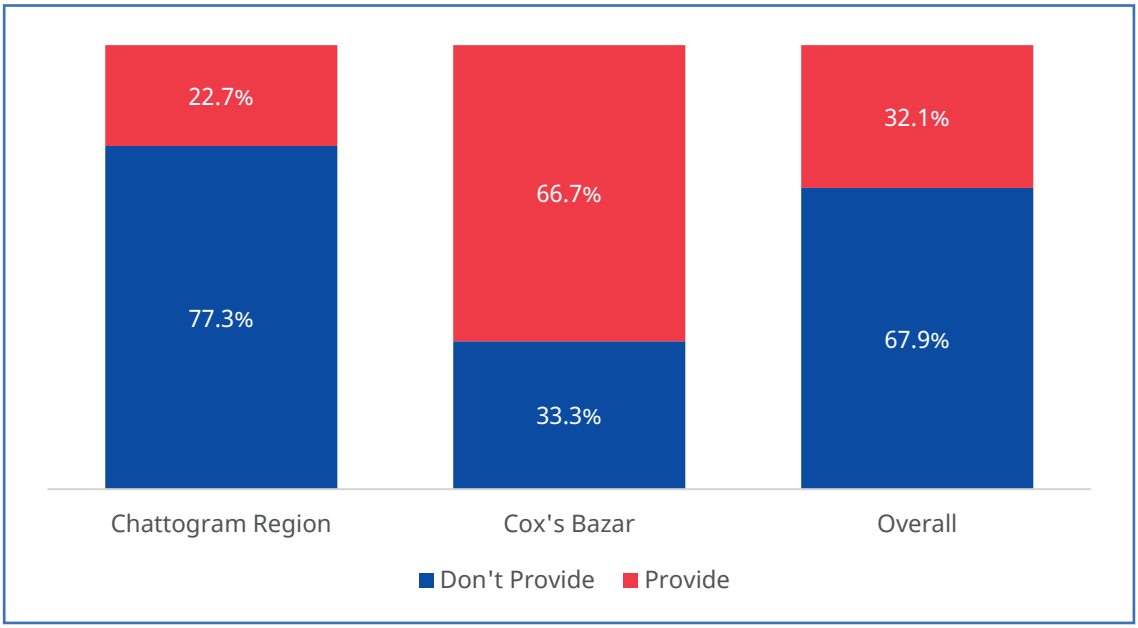


Source: Survey of TVET providers.

3.10.17. Status of work-based learning, including apprenticeships

Formal apprenticeships are crucial in technical and vocational education, yet only 32 per cent of TVET providers stated that they arrange formal apprenticeship opportunities for their trainees in tourism courses. In the Chattogram region this rate is even lower, with just 22.7 per cent of providers offering such opportunities for tourism courses. As most of the jobs in the tourism and hospitality sector are informal, the opportunity for formal apprenticeships is ultimately quite low in this sector. However, TVET providers in Cox's Bazar seemed more determined to arrange such apprenticeship, with two-thirds of providers stating they try to arrange apprenticeships for their tourism trainees, at least for a short period of time.

▶ Figure 64. Availability of apprenticeship opportunities linked to tourism and hospitality-related TVET programmes (%)



Source: Survey of TVET providers.

3.10.18. Internal factors affecting the sustainability of TVET providers

The matrix below lists a few of the internal factors that affect the organizational sustainability of a TVET provider.

▶ Table 15. Presence of internal factors affecting the sustainability of TVET providers offering tourism-related courses

Internal factor	Company/ industry-affiliated training centres	For-profit TVET providers	Not-for-profit TVET providers (NGOs)	Polytechnic institute	Other
Have strategic plan/long-term plan	0%	0%	67%	100%	100%
Have annual work/ operational plan for employees	0%	0%	67%	100%	100%
Have separate HR department	0%	0%	100%	100%	100%
Have HR policy	100%	0%	67%	100%	100%
Have separate accounts department	100%	100%	100%	100%	100%
Perform internal financial audit	100%	100%	100%	100%	100%
Audited by an external auditor	0%	0%	100%	100%	100%

Source: Survey of TVET providers.

TVET providers offering tourism and hospitality-related courses were asked if they have a strategic plan, a separate HR department, a separate accounts department, and perform internal financial audits. Two-thirds of the not-for-profit TVET providers reported having strategic plans and annual work plans; whereas company-affiliated training centres and private training centres all lacked strategic plans and annual work plans. The one polytechnic institute surveyed stated that it has/maintains all the factors mentioned in the matrix above. These factors indicate how a provider operates at a structural level, which has a direct impact on its sustainability and future growth.

3.10.19. Future plans and sustainability mechanisms of TVET providers

A few indications concerning the future plans and sustainability mechanisms of TVET providers offering tourism and hospitality-related courses were uncovered through the study, as follows:

- The qualitative data suggests that the donor-funded TVET providers can better sustain themselves by charging fees to students.
- TVET providers can benefit from forging more formal links with the tourism industry, which can help them train the students according to the industry's needs and qualification requirements.
- TVET providers mostly follow traditional methods of delivering services. Instead, to improve their service delivery, TVET providers need to embrace digital and international standards. This means they should enable online registration for students, and train them to increase their skills such that they can improve their ability to send remittances as overseas workers.
- The TVET providers also need to offer more RPL for courses and certification programmes in different trades, so as to supply more workers to the local market and boost economic growth in the sector.
- To achieve sustainability, TVET providers need financial support from both the Government and NGOs as they transition from a donor funding-based model to a fee-based model.

▶ 3.11. Sector-specific key supply side systemic constraints and challenges

3.11.1. Relevance of curricula and qualifications

Curricula for tourism and hospitality-related courses are not well aligned with the changing trends and needs of the tourism industry. As a result, TVET providers cannot deliver the supply of adequately skilled workers that the tourism industry needs. FGD insights indicate that the curriculum needs to be more oriented toward meeting industry needs, and thus enabling more market-focused skill supply. The present scenario suggests that students face constraints in accessing jobs in the industry due to a lack of adequate skills required to meet the criteria mentioned in job descriptions. At the STED Workshop a variety of stakeholders reiterated the need to update the curriculum to meet the changing trends and needs of tourism enterprises, such as the inclusion of modern technologies.

Moreover, curricula related to persons with disabilities also need to be introduced to foster an inclusive training environment. For example, a curriculum developed for persons with visual impairments can serve as a driver to ensure that no one is behind in accessing a quality life. From the interviews with the BTEB officials, it was noted that the curricula of short courses in particular are not designed with any consideration for persons with disabilities. However, for diploma courses, there is evidence that the curriculum is designed in consideration of this segment of learners and is implemented in TVET providers. That said, diploma-level courses related to tourism appear to be in short supply in the Chattogram–Cox's Bazar region, with one of the few such programmes recently being discontinued by the Cox's Bazar Polytechnic. This situation only further highlights the need for curricula attuned to the needs of persons with disabilities at other certification levels.

3.11.2. Delivery and assessment practices

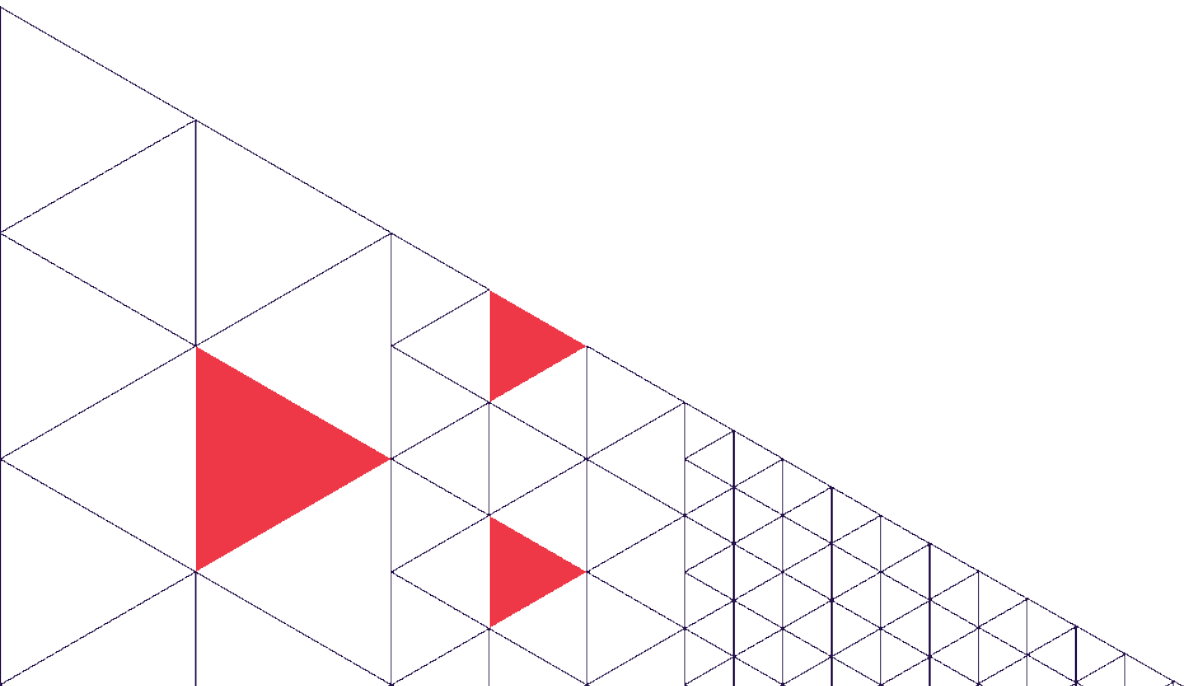
The study team found that the TVET instructors need to update their knowledge and skills on the latest trends and demands in the tourism and hospitality sector, as well as adopt modern teaching methods and delivery mechanism that can engage the students effectively. The study team also noted that TVET

providers need more female instructors to promote gender inclusiveness and to overcome the social barriers that discourage female students from enrolling in tourism courses.

As for assessment practice, formal courses have a definite assessment method prescribed by the BTEB. But informal courses sometimes do not follow any standard assessment mechanism. As a result, the true potential of a graduate cannot be fully understood.

3.11.3. TVET providers' linkages and support for work-based learning

The tourism and hospitality sector suffers from a lack of meaningful and formal linkages between TVET providers and industry, which manifests in limited capacity for students to engage in work-based learning. as a result, graduates ultimately suffer from a lack of job offers upon completing their training. This demotivates prospective students from in enrolling in the TVET providers. This is one of the major challenges that TVET providers from both Chattogram and Cox's Bazar must address.



▶ 3.12. Skills gap analysis

From the ESS, major occupations for the construction sector were identified, and during the STED Workshop, stakeholders also identified the most in-demand occupations and skills in the sector. On the other side of the equation, the skills supply assessment identified the range of TVET providers offering tourism and hospitality-related skills development programmes. Based on the information gathered from the STED Workshop and the primary surveys, the training gap analysis table below was constructed. Table 15 shows major occupations in the tourism and hospitality sector, the relevant skills training required, and the degree to which this training is available. Availability frequency was derived from the frequency with which a specific course/training was reported by TVET providers and how related that skill training is to each specific occupation.

▶Table 16. Training gap analysis for priority occupations in the tourism and hospitality sector

Major occupations	Skills training needed from TVET providers	Availability of training	Remarks
Front Office Executive	▶ Reservation management, ▶ Complaint managemen	Adequately available	
Tour Guide	▶ Tour planning, ▶ Tour operation, ▶ Eco-tour operation	Not available	There is absolutely no eco-tour guide skills training available, but skills training related to guiding tours in general is adequately available.
	▶ Making beds, ▶ Cleaning, ▶ Washing and laundry	Adequately available	
Hotel Manager	▶ Reservation management, Expense tracking, ▶ Inventory tracking	Adequately available	
Food and Beverage Service	▶ Serving food and beverag	Adequately available	
Catering Service	▶ Serving food and beverages, ▶ Event management		
Reservation Executive	▶ Ticketing, ▶ Reservation management	Not available	One informal course is available, but only in Chattogram.
Chef/Cook	▶ Preparing and decorating food	Adequately available	

For most of the traditional occupations that are still in-demand in the tourism and hospitality sector, skills training is considered to be adequately available at present. But for some emerging occupations, such as Eco Tour Guides and Reservation Executives, there is no formal skills training available in the Chattogram region or Cox's Bazar.

▶ 3.13. Recommendations

The STED process served as a forum for stakeholders to not only validate the outcomes of FGDs, KIIs, and surveys but also to contribute additional perspectives. It facilitated the development of a collective comprehension regarding skills needs and challenges in the sector. Moreover, this collaborative platform enabled stakeholders to generate recommendations aimed at addressing the identified and prioritized skills needs and challenges, fostering a pathway for future growth and success in the sector.

Specific occupational skills

- Front Office Managers need to be provided with the necessary qualifications and skills, as these occupations face hard-to-fill vacancies. This can be done by providing specialized education and training.
- The number of Tour Guide and Marketing and Sales Executive applicants was found to be too low to meet demand, indicating shortages of these occupations, which can be minimized by promoting these professions by highlighting the potential career prospects among youth and providing the necessary training and qualifications to them.
- Chefs/Cooks will be in demand, as hotel and restaurant businesses are expected to increase in number in the Chattogram–Cox's Bazar region due to the increasing numbers of tourists. This demand can be addressed by enhancing working environments, easing working conditions and increasing the qualifications of candidates.
- Relevant industry associations, along with TVET providers, can collaborate with the BTEB to address the inadequacy of TVET providers offering formal courses related to tourism. Increasing the number of registered training centres dedicated to the tourism and hospitality sector should be possible through collaborative efforts, and sector-specific courses tailored to the demands of industry – such as tour guiding, tour operation, housekeeping, and food and beverage services – should be introduced.
- Expand the offerings courses related to the tourism and hospitality industry to support the sector in introducing newer and diversified entertainment experiences. Explore sports tourism opportunities, including activities such as parasailing, kayaking, ropeway adventures, surfing, rock climbing, and more.
- Leverage the existing capacity of the Sayeman Hotel to provide courses in surfing. Ensure the commercialization and formalization of the training programmes, utilizing the resources and expertise available.
- Introduce courses related to reservation processes, covering booking and ticketing. Target Front Desk Officers and Tour Operators to enhance their skills in managing reservations effectively through upskilling training and certifications.

Core work skills

- The core working skills include digital marketing for Sales and Marketing Managers, who also need to be equipped with people and client management skills and communication skills.
- Tour Guides need to be skilled in providing direction, explain historical and ecological information concerning the tourist spots, and good communication skills.
- Extend the curriculum beyond technical skills to include essential soft skills. Integrate components on navigation, effective communication, customer service, and complaint mechanisms to ensure a holistic skill set among trainees.
- Strengthen training programmes to specifically target the development of interpersonal skills. Emphasize the importance of effective communication, teamwork, and positive customer interactions in the tourism and hospitality sector.

Collaboration between employers and training providers

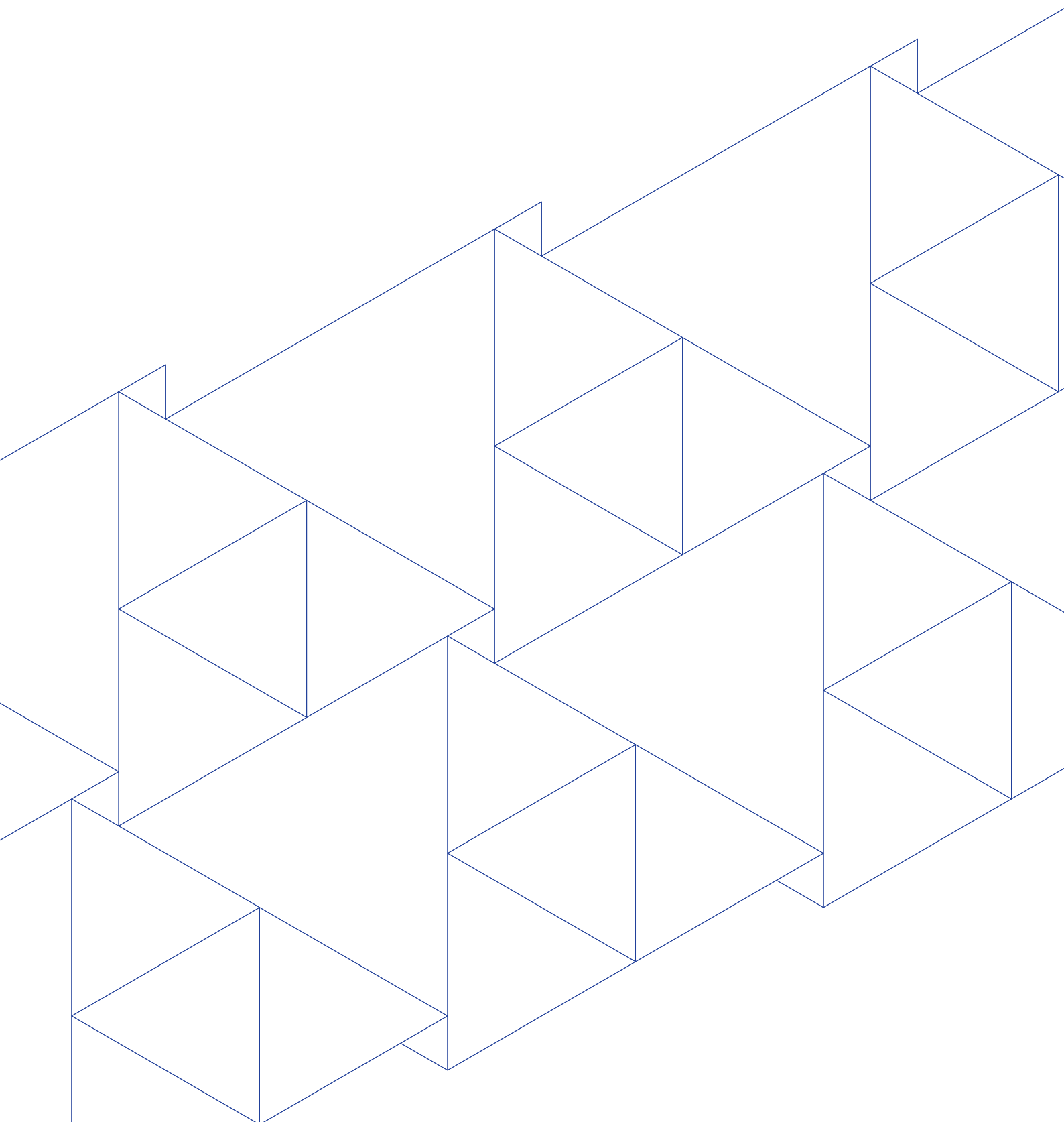
- Encourage development partners and TVET providers to establish robust collaborations with leading hotels. This involves creating partnerships that facilitate training and apprenticeship opportunities for individuals aspiring to work in the hospitality sector. Leveraging the expertise and resources of top-rated hotels enhances the quality and relevance of the training provided.
- Advise TVET providers to engage in formal agreements by signing MOUs with hotels and tour operators. These MOUs should outline the terms for providing graduates with workplace-based training and internship opportunities. Establishing such partnerships strengthens the connection between training programmes and real-world industry practices.
- ISCs can play a vital role in analysing future trends and demand in the tourism and hospitality sector and communicate accordingly with TVET providers to align their training programme with future demand.

Access to skills development, social inclusivity and lifelong learning

- Advocate for TVET providers to collaborate with the BTEB to implement RPL programmes for different occupations, such as Chefs and Tour Operators. This collaboration should aim to certify experienced industry workers, acknowledging their skills and expertise gained through practical employment experience.
- Encourage existing TVET providers to identify potential trainee hotspots, including areas such as the Chittagong Hill Tracts and distant upazilas. Establishing temporary training centres in these locations addresses access barriers and ensures that skill development opportunities are extended to individuals in remote or underserved areas.
- Suggest adapting desk-based occupations, such as front desk jobs, booking, and reservation, to be more inclusive for persons with disabilities. This involves creating tailored training programmes that consider the unique needs and capabilities of individuals with disabilities, fostering an inclusive and accessible learning environment.
- Emphasize the use of online education platforms to make skills development accessible to a broader audience, including remote or part-time workers.
- Local government, along with industry associations, can promote inclusive hiring practices within the tourism and hospitality industry and encourage employers to provide equal opportunities for training and career advancement to underrepresented groups, fostering diversity and inclusivity in the workforce.

Wider systemic changes

- The ILO, in collaboration with local authorities, such as the Cox's Bazar Development Authority, can play a crucial role in advocating for the introduction of a regional policy specifically tailored for the tourism and hospitality industry in the Chattogram–Cox's Bazar region. This would involve engaging with relevant stakeholders, policymakers and industry representatives to highlight the unique needs and challenges of the region and to formulate policies that promote sustainable growth, infrastructure development and enhanced visitor experiences.
- Advocate with the authoritative bodies, such as the Bangladesh Tourism Board and the Bangladesh Parjatan Corporation, to better ensure effective regulation, enforcement of compliance, and overall improvement of industry practices in line with regional requirements and standards.



4

Transport sector

Chapter 4. Transport sector

▶ 4.1. Introduction

The transport sector of Bangladesh is a vital part of the country's economy, as it facilitates the movement of goods and people, supports trade and tourism, and creates employment and income opportunities. Bangladesh has entered into a new era of connectivity as a result of the completion of a number of mega transportation infrastructure projects, such as Padma Bridge in June 2022, Metro Rail in December 2022, and the Karnaphuli Tunnel in October 2023, with more still underway. Table 16 provides a brief overview of the mega transportation projects that have been and will be undertaken in Chattogram–Cox's Bazar region.

▶Table 17. Transportation mega projects in the Chattogram–Cox's Bazar region

Mega projects in Chattogram–Cox's Bazar region	Date/Estimated date of completion	Investment
Karnaphuli Tunnel	October 2023	13 858 crore taka
Chattogram Elevated Expressway	November 2023	4 298.95 crore taka
Dhaka–Chattogram Highspeed Railway	December 2024	93 350.93 crore taka
Chattogram–Cox's Bazar Railway Link	November 2023	18 034 crore taka
Matarbari Deep Sea Port	January 2026	17 777 crore taka
Chattogram Metro Rail	Proposed	n/a
Cox's Bazar International Airport	November 2023	1 568.86 crore taka

The Chattogram–Cox's Bazar region is a strategic area for the development of the transport sector, as it hosts the country's largest port, the Port of Chattogram, and the upcoming first deep-sea port, the Port of Matarbari. The region also has a rich natural and cultural heritage, attracting millions of tourists every year. All these connectivity projects have created and will create thousands of employment opportunities and have a vital impact on GDP. In addition to the projects above, the establishment of the Chattogram–Cox's Bazar Economic Corridor (CCEC) represents the creation of a strategic area for the development of the transport sector, as well as other sectors such as tourism, construction and manufacturing. The CCEC

will integrate the Port of Chattogram, the Port of Matarbari, the Chattogram–Cox's Bazar Railway, the Chattogram–Cox's Bazar Highway, and the Cox's Bazar International Airport, and will create a seamless and efficient transport network for the region and beyond. Undoubtedly, the transport industry of the region will flourish in the near future. All these opportunities pave the way for developing a broader vision for the transport sector of the Chattogram region and Cox's Bazar.

▶ 4.2. Profile and situation analysis for the transport sector

4.2.1. Economic profile

The transport sector contributed 7.34 per cent of national GCP in the 2021–22 financial year, and 7.32 per cent in 2022–23. The overall growth rate of the sector was 5.75 per cent in 2021–22 and 5.99 per cent in 2022–23 (Bangladesh, Ministry of Finance 2023). The transport sector in the Chattogram–Cox's Bazar region includes road, rail, water and air transport, as well as warehousing and storage, postal and courier services, and other transport support activities (ADB, n.d.-a). The transport sector of the Chattogram–Cox's Bazar region is very crucial for the economic and productive activities of Bangladesh, as the region contains major seaports catering to 95 per cent of external trade movements and 97 per cent of container traffic (ADB 2020). The region also holds one of the three international airports on its soil, indicating significant contribution of the region in terms of economic progress. While the GDP contribution of the transport sector in the Chattogram–Cox's Bazar region is not available from secondary sources, it can be envisioned based on the above statistics that the region's transport sector makes a major contribution to the national economy.

4.2.2. Workforce profile

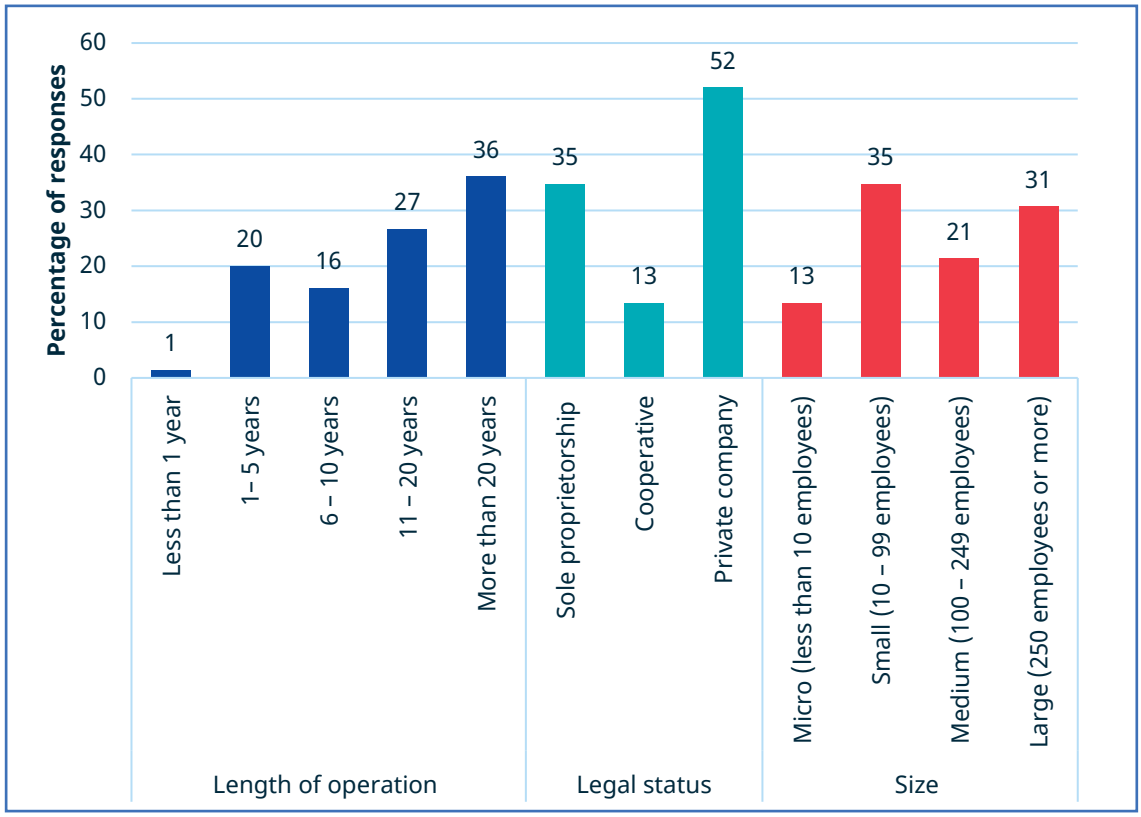
According to the Economic Census 2013, the transport sector at the national level covers 13.65 per cent share of the service sector, and consists of 1,102,371 economic units (Bangladesh, BBS 2013b). The Chattogram–Cox's Bazar transport sector holds about 106,212 economic units, which accounts for roughly 9.6 per cent of the national total. According to the Bangladesh Bureau of Statistics, the transport sector employed 5,236,000 persons in 2017, or 10.2 per cent of all employed persons in Bangladesh. The average number of persons per establishment in the transport sector was 4.8 (O'Neill 2023). According to the Centre for Policy Dialogue, the transport sector employed 6,000,000 persons in 2019, or 10.7 per cent of all employed persons in Bangladesh. The transport sector created 1,000,000 jobs between 2016 and 2019, mainly in the road transport subsector (Khatun 2012). While transport sector employment data for the Chattogram–Cox's Bazar region is not available from authoritative sources, it is still can be inferred from the national statistics that there is huge potential for regional employment creation in the transport sector due to the rapid development in the region. Considering the megaprojects in the Chattogram–Cox's Bazar region listed in table 16 above, the regional transport sector is expected to have notable growth in terms of both productivity and employment generation.

4.2.3. Business profile

According to the Economic Census of 2013, the number of transport sector establishments in each of the three Chattogram Hill Tracts districts is relatively small, with 284 in Bandarban, 528 in Rangamati, and 1,112 in Khagrachari. A substantial increase is seen in Cox's Bazar, which hosts 6,728 establishments, reflecting perhaps a more developed transport infrastructure likely tied to its status as a tourist destination. Chattogram stands out significantly from the other districts, with a total of 14,999 establishments, which can be attributed to its prominence as a major port city and commercial hub, necessitating a vast transport network.

Figure 65 shows that a more than 60 per cent of the surveyed transport enterprises in the region have been in operation for more than 10 years, with 27 per cent having been in operation for 11–20 years, and 36 per cent having been around for more than 20 years (36 per cent). By legal status, a slight majority of the surveyed enterprises are private companies (52 per cent), followed by sole proprietorships (35 per cent) and cooperatives (13 per cent). By enterprise size, 35 per cent are small (10–99 employees), while 31 per cent are categorized large (250 employees or more). An additional 21 per cent are medium enterprises (100–249 employees), and 13 per cent are considered micro enterprises (fewer than 10 employees).

▶ Figure 65. Overview of surveyed transport sector enterprises: Length of business operation, legal status and size of enterprises (% of respondents, N=75)

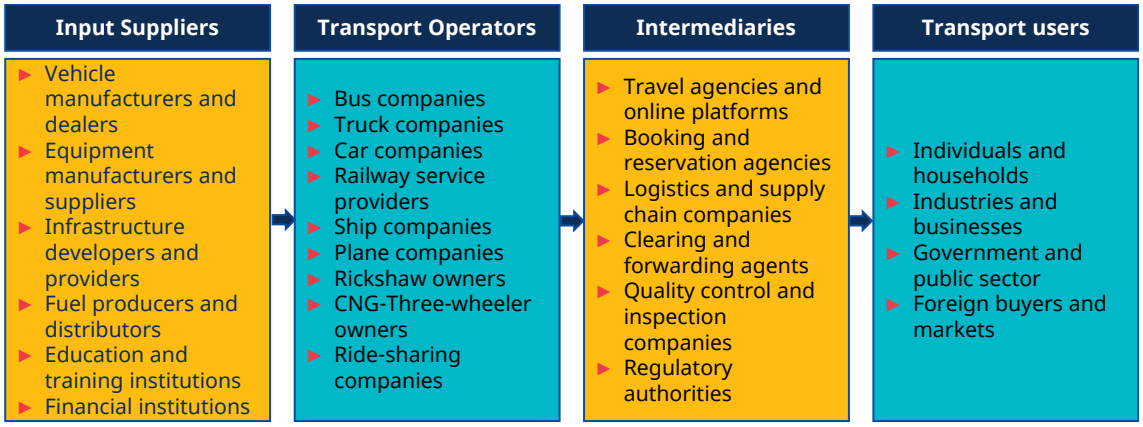


Source: ESS 2023.

4.2.4. Value chain analysis

Based on the secondary review, this study mapped an overall generic value chain for the transport sector (figure 66), which includes various components such as input suppliers, transport operators, intermediaries, and transport users. Each of the said components are described below.

▶Figure 66. Generic sector value chain for the transport



Source: Shohag 2018; Rabbani 2022.

Input suppliers

These are the entities that provide the necessary inputs for the transport sector, such as vehicles, equipment, infrastructure, fuel, human resources, and so on. Some examples of input suppliers in Bangladesh include:

- Vehicle manufacturers and dealers that supply buses, trucks, cars, trains, ships and planes to transport operators.
- Equipment manufacturers and suppliers that supply engines, tires, brakes, spare parts, and other components to transport operators.
- Infrastructure developers and providers that supply roads, railways, ports, airports, and other facilities for transport operators to utilize.
- Fuel producers and distributors that supply petrol, diesel, gas, and electricity to transport operators.
- Education and training institutions that offer courses and programmes for transport professionals and workers.
- Financial institutions that provide loans and credits to transport businesses and investors.

Transport operators

These are the entities that directly provide transport services to customers using vehicles, equipment, infrastructure, fuel and human resources. They add value to the inputs by moving people and goods from one place to another. Some examples of transport operators in Bangladesh are:

- Bus companies that provide passenger transport services within and between cities and regions.
- Truck companies that provide freight transport services within and between cities and regions.
- Car companies that provide taxi and ride-hailing services within cities and regions.
- Rail companies that provide passenger and freight transport services within and between cities and regions.

- Ship companies that provide passenger and freight transport services within and between coastal and inland waterways.
- Plane companies that provide passenger and freight transport services within and between domestic and international airports.

Intermediaries

These are the entities that facilitate the connection between transport operators and transport users, such as marketing, booking, logistics and so on. They add value to the transport services by making them available and accessible to customers. Some examples of transport intermediaries in Bangladesh are:

- Travel agencies and online platforms that promote and sell transport services to customers.
- Booking and reservation systems that enable customers to book and pay for transport services online or offline.
- Logistics and supply chain companies that manage the flow of goods and information from the suppliers to customers.
- Clearing and forwarding agents that handle the customs clearance and documentation of the goods transported across borders.
- Quality control and inspection companies that ensure the quality and safety of the transport services provided to customers.

Transport users

These are the final consumers of transport services, who use them for various purposes, such as personal, household, industrial, commercial and so on. They derive value from the transport services by reaching their destinations and receiving their goods. Some examples of transport users in Bangladesh are:

- Individuals and households who use transport services for personal or household purposes, such as commuting, traveling, shopping and so on.
- Industries and businesses who use transport services for industrial or commercial purposes, such as sourcing, producing, distributing and so on.
- Government and public sector who use transport services for public or social purposes, such as providing public transport, emergency services and so on.
- Foreign buyers and markets who use transport services for export or trade purposes, such as importing or exporting goods and services.

4.2.5. Institutional mapping of the transport sector

This section provides a brief overview of major players in Bangladesh's transport sector. A more comprehensive outline of these actors can be found in the institutional mapping shown in annex table 5.

Within the transport sector, the construction of major highways and bridges falls under the jurisdiction of the Ministry of Road Transport and Bridges, which is also responsible for developing and maintaining the nation's vital road infrastructure. The Road and Highways Department is in charge of overseeing district and national highways, with an emphasis on infrastructure upkeep and development to guarantee seamless connection. Bangladesh Railways is managed and run by the Ministry of Railways, which also provides freight and passenger services that are essential for both internal and international travel. The Local Government Engineering Department and the Ministry of Local Government, Rural Development and Cooperatives supervise the development of rural roads and ensure connectivity in these areas, City Corporations are in charge of managing urban roads and transportation within their respective city areas. Furthermore, organizations such as the Bangladesh Inland Water Transport Authority (BIWTA)

oversees domestic aquatic transportation; while the Ministry of Shipping, the Chittagong Port Authority, and the Mongla Port Authority oversee seaports and inland waterways. The Planning Commission synchronizes transportation investments and policy across modes; while the Land Port Authority oversees land ports, which are crucial for international trade. The Transport NDC Working Group offers a venue for collaboration for important ministries. Local governments, at various levels, contribute to transportation infrastructure development, often relying on central government grants for funding. This institutional framework reflects the diverse and interconnected nature of the transport sector in Bangladesh, which is critical for the country's economic development and connectivity.

4.2.6. Analysis of the business environment: SWOT and drivers of change

This section provides a SWOT analysis of the transport sector in Chattogram–Cox's Bazar region, capturing the complexities of its workforce dynamics.

- **Strengths**
  The strengths of the sector are rooted in a skilled workforce that is proficient in practical aspects such as driving and vehicle maintenance, as evidenced by FGDs in the Chattogram–Cox's Bazar region. Additionally, the workforce is recognized for its communication, teamwork and problem-solving abilities, indicating a solid foundation of soft skills, a viewpoint that was reinforced by both FGD and KII inputs from the region. Apprenticeship training and a willingness to employ and train late entrants highlight the sector's openness to developing its workforce.

- **Weaknesses**
  However, the analysis also identified significant weaknesses, such as the lack of formal certification for skilled workers, which could limit their job opportunities, as highlighted by a KII in Cox's Bazar. There is a noted discrepancy between the education/training provided and the practical needs of the sector, coupled with an absence of soft skills training for specific roles. Furthermore, despite the technical skills of the workforce, there are insufficient quality job opportunities, and security concerns such as extortion and robbery further plague the sector (FGD, Cox's Bazar).

- **Opportunities**
  Occupational opportunities are promising in the transport sector. Specifically, there are likely great future opportunities for following the occupations as the sector grows:

  - Railway Engineers, Technicians, Operators and Managers in the railway subsector[9];
  - Port Workers, Operators, Managers and Customs Officers, who are involved in the loading, unloading, handling and clearance of cargo and passengers at the seaports[10]; and
  - Drivers, Conductors, Mechanics, and Transport Operators.

- **Threats**
  The threats to the sector are multifaceted, with a lack of adequate and qualified human resources posing a notable threat to the sector (ADB 2023). It was also revealed through the secondary review that the transport sector may face a shortage of skilled Engineers, Technicians, Operators, Managers and Customs Officers that can handle the complex and advanced technologies and systems involved in transport projects[11]. The transport sector may face challenges in maintaining and improving the quality, efficiency and safety of transport operations and infrastructure, as well as in attracting and retaining customers and investors (Bangladesh, Public Private Partnership Authority, n.d.).

9 See: ADB 2023; Bangladesh Public Private Partnership Authority, n.d.; Faruque 2023; Newton 2023; and Chowdhury 2023.
10 See: Faruque 2023; and Newton 2023.
11 See: ADB 2023; Bangladesh, BBS 2020; and Bangladesh, Public Private Partnership Authority. n.d.

▶ 4.3. Profile of major occupations

There are a multitude of occupations in the transport sector, but this section only describes major occupations as determined through the secondary review, FGDs, KIIs and the ESS survey.

Welding

Welders are required to have proficiency in various welding techniques, such as bodywork/building the bodies of vehicles. They should also possess an understanding of metallurgy to work with different types of metals effectively. Reading and interpreting blueprints is essential for accurately joining metal parts. Safety procedures, including proper handling of welding equipment and protective gear, are crucial to ensure a safe working environment.

Refrigeration and air-conditioning

Refrigeration and Air-conditioning Technicians need a solid understanding of air-conditioning systems, including installation, maintenance and repair. Troubleshooting skills are essential to diagnose and resolve issues efficiently. Knowledge of refrigerants and adherence to environmental regulations is critical due to the nature of the work.

Electrical and navigational equipment installation

Technicians involved in installing electrical and navigational equipment on marine vessels require technical knowledge of navigational systems. They should also possess the electrical skills needed to handle wiring and connections. Understanding marine operations is necessary to ensure proper installation and functionality.

Heating, ventilation, air conditioning (HVAC) and refrigeration

HVAC and refrigeration professionals need in-depth knowledge of HVAC design, installation, maintenance and regulatory compliance. Troubleshooting skills are vital to identify and resolve system issues effectively.

Auto electrical servicing

Professionals in this field need expertise in diagnosing electrical issues in vehicles. They should be skilled in repairing automotive electronics and computerized management systems. This occupation demands a deep understanding of vehicle electrical systems.

Air duct servicing

Air Duct Service Technicians require knowledge of ventilation systems, including ductwork design and maintenance. They should also have an understanding of indoor air quality standards to ensure clean and efficient airflow within vehicles.

Besides the above-mentioned occupations, the sector also includes: Electrical Installation and Maintenance, Fitting, Motorcycle Servicing, Machine Shop Practice, Automotive Mechanics, Marine Diesel Engine Artificer Works, Pipe Fitting, Ship Piping, Ship Painting, Ship Machinery Installation, and Maritime Safety and Security-related occupations.

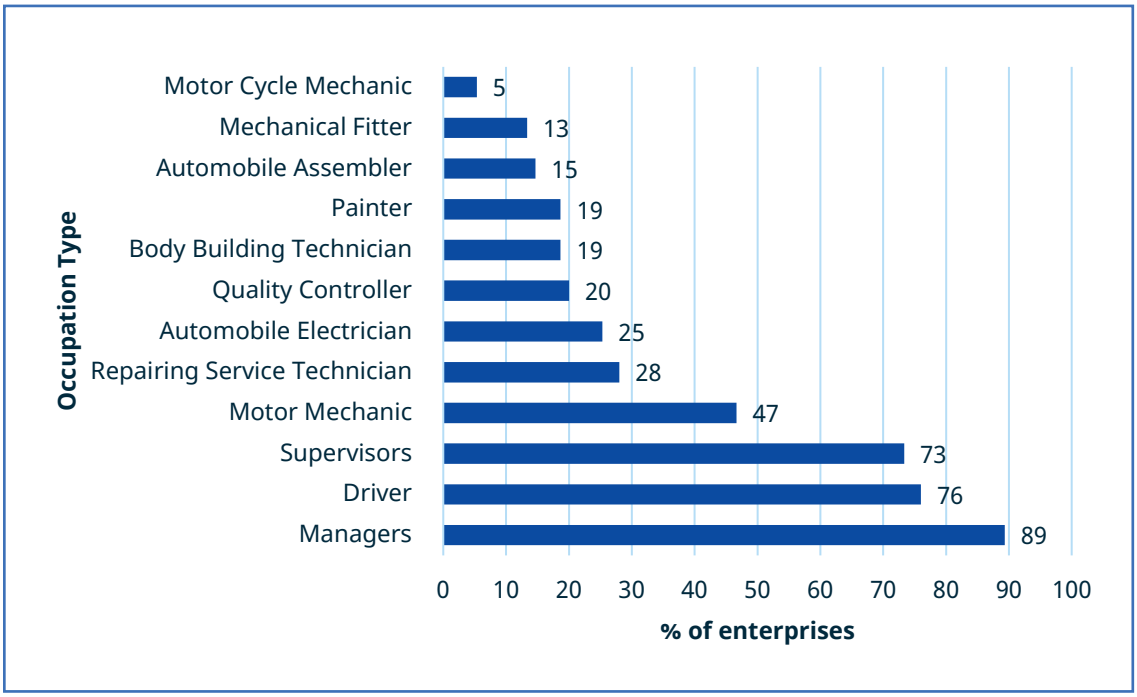
4.3.1. Major occupations and their required skills

The surveyed enterprises were asked to name the major occupations in the transport sector, with the results indicating a diverse range of major occupations (figure 67). Managers and Supervisors were along the top three most commonly cited occupations (by 89 per cent and 73 per cent of enterprises,

respectively), and are instrumental in overseeing operations and ensuring efficiency in logistics and supply chains. Drivers were the next most commonly cited occupation (76 per cent of enterprises) and are the backbone of the sector, providing the essential service of moving goods and passengers. At a distant fourth place, Motor Mechanics (47 per cent) are vital for the maintenance and repair of vehicles, ensuring they are safe and operational.

The drivers at the heart of the sector require not only technical driving skills but also navigation abilities and knowledge of safety regulations. A representative from the transport business association in Chattogram made a similar statement to this effect during a KII: "The workers and employees in this sector need proper driving skills, safety regulation knowledge and communication skills to succeed." Another business association representative from Cox's Bazar added: "Cooling skills, tire tube skills, dashboard skills, painting skills are also necessary in this sector." For technical roles such as Motor Mechanics and Automobile Electricians, specialized skills in vehicle diagnostics, repair and maintenance are necessary.

▶ Figure 67. Major occupations in the transport sector according to surveyed enterprises (% of respondents, N=75)



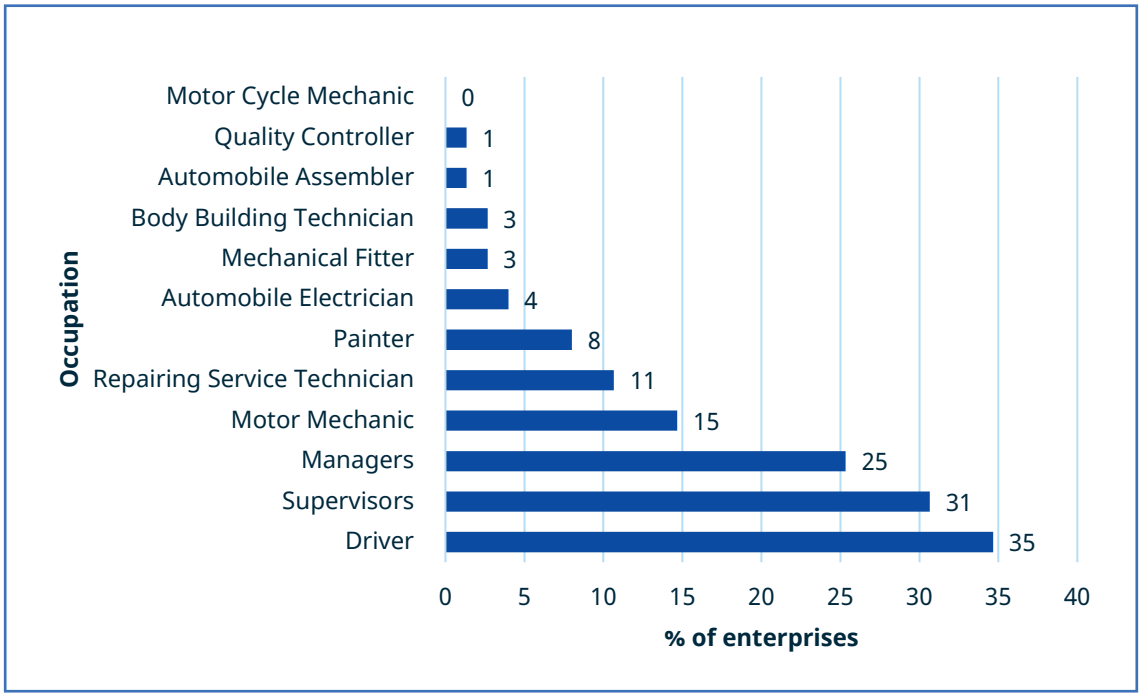
Source: ESS 2023.

4.3.2. Recruitment

Figure 68 shows that Drivers are the most sought-after occupation at the moment, with 35 per cent of enterprises reporting job vacancies for this role. This suggests a significant demand for driving roles, possibly reflecting a growing need for transportation and logistics services within the region. Supervisors and Managers closely follow, with 31 per cent and 25 per cent of enterprises, respectively, reporting having vacancies for these roles, indicating a strong demand for leadership to develop strategies and to oversee and coordinate various aspects of enterprise operations. Roles such as Motor Mechanics, Repairing Service Technicians, and Painters also show notable demand, with 15 per cent, 11 per cent, and 8 per cent of enterprises, respectively, reporting vacancies. This suggests a thriving market for

skilled positions related to vehicle maintenance, repair, and painting services. Automobile Electricians, Mechanical Fitters, Body Building Technicians, Automobile Assemblers, and Quality Controllers each contribute to the job vacancies, albeit among smaller percentages of enterprises. These roles indicate a diverse range of employment opportunities within the local transport sector job market.

▶Figure 68. Vacant positions in surveyed transport enterprises (% of respondents,

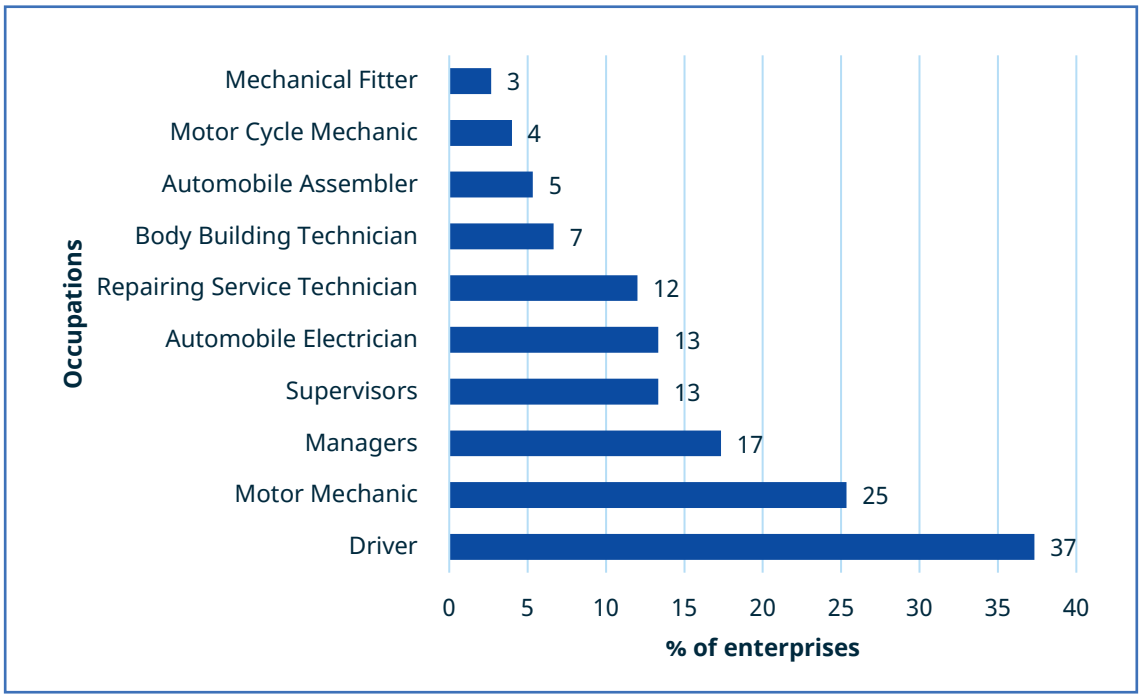


Note: Multiple responses possible. Source: ESS 2023.

4.3.3. Hard-to-fill occupations in the transport sector

Figure 69 presents the occupations that are hard to fill, according to the surveyed enterprises. Drivers emerge as the occupation facing the most significant challenges when it comes to filling vacant positions, with 37 per cent of enterprises reporting difficulties in recruiting individuals for this role. This high demand for drivers could be attributed to the region's transportation and logistics needs, emphasizing the critical role drivers play in maintaining supply chains and ensuring the movement of goods and people. Motor Mechanics closely follow, with 25 per cent of enterprises reporting difficulties filling this role. This underscores the specialized skills and knowledge required for this occupation, indicating a demand for individuals capable of servicing and repairing vehicles. Managers and Supervisors are also relatively difficult roles to fill, with 17 per cent and 13 per cent of enterprises, respectively, reporting difficulties in securing individuals for these leadership roles. This suggests a demand for experienced professionals who can oversee and lead various aspects of enterprise operations.

▶ Figure 69. Hard-to-fill occupations in the transport sector according to surveyed enterprises (% of respondents, N=75)



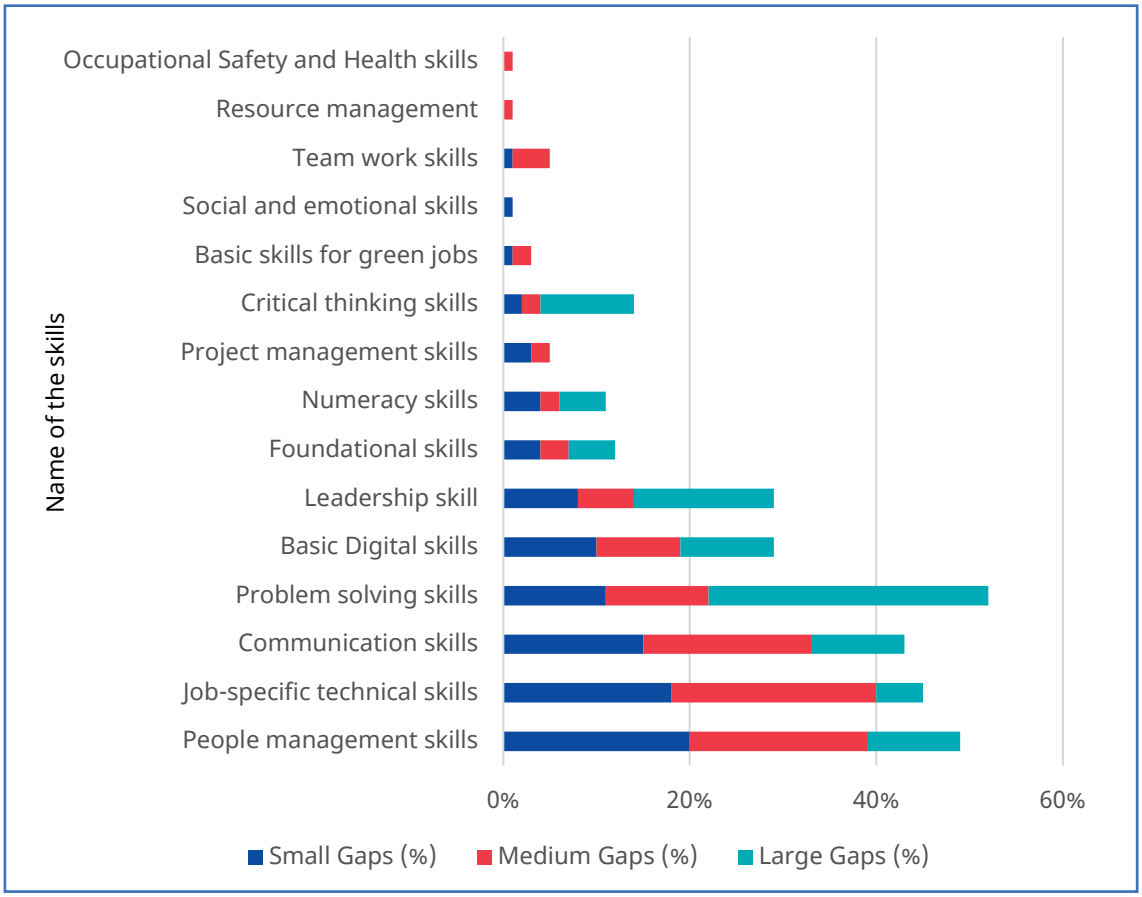
Note: Multiple responses possible. Source: ESS 2023.

▶ 4.4. Current workforce and skills

Figure 70 below presents an overview of the skills gaps in the current transport sector workforce within the Chattogram–Cox's Bazar region according to the surveyed enterprises. The areas that were most commonly cited by enterprises as having skills gaps – and therefore indicating the most significant need for improvement – are as follows:

- **Problem-solving skills:** This is the most commonly cited area when it comes to skills gaps as the most of enterprises classifying the gaps as being large in nature. This suggests a strong degree of deficiency in this area and a consequent need for training on strategies for coping with common problems.
- **People management skills:** This suggests a critical need for enhanced training in people management-related practices.
- **Job-specific technical skills:** There is a substantial gap in job-specific technical skills, which are crucial for operational efficiency.
- **Communication skills:** Communication skills require urgent attention to improve overall productivity and harmony within the workforce.

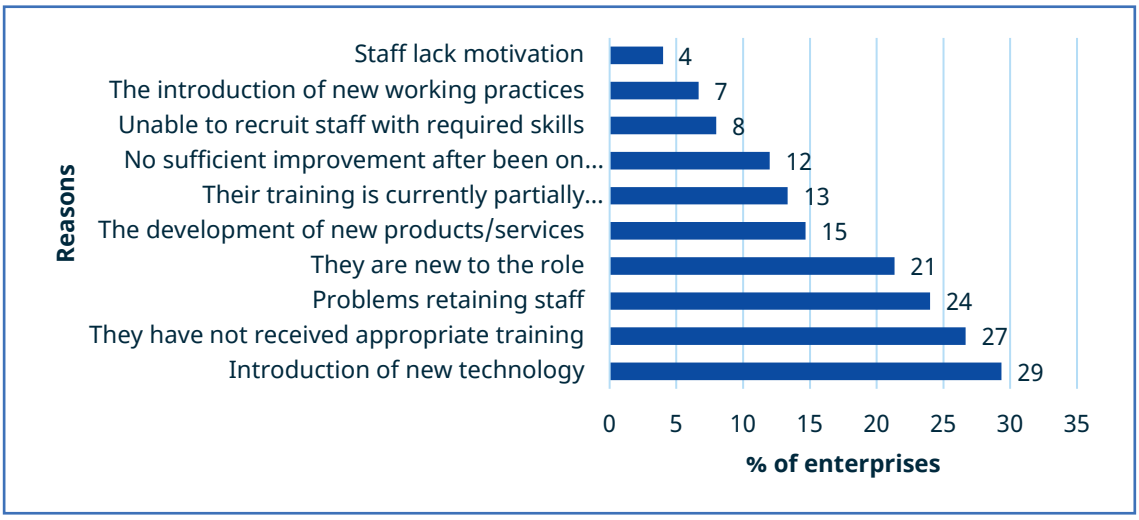
▶Figure 70. Skills gaps cited by transport enterprises (% of respondents, N=75)



Note: Multiple responses possible. Source: ESS 2023.

Figure 71 presents the reasons for proficiency gaps within the transport sector workforce, according to surveyed enterprises, shedding light on the challenges workers face in reaching full proficiency. The introduction of new technology was the most commonly cited cause (29 per cent of enterprises), suggesting that the rapid pace of technological change is outstripping the current skill set of many workers. Workers not receiving the appropriate training for their roles was the second-most commonly cited reason (27 per cent of enterprises) indicating potential deficiencies in the existing training frameworks and content, which may not fully equip the workforce with the practical skills required in their daily tasks. To address this, a thorough review and revamp of training programmes may be necessary to ensure they are relevant and comprehensive. The survey results also suggest a sizable portion of the workforce is new to their roles, and thus not yet fully proficient. This calls for robust onboarding processes that can accelerate the journey to proficiency, including mentorships and support systems for new hires.

▶ Figure 71. Main causes of workers not being fully proficient, according to transport enterprises (% of respondents, N=75)

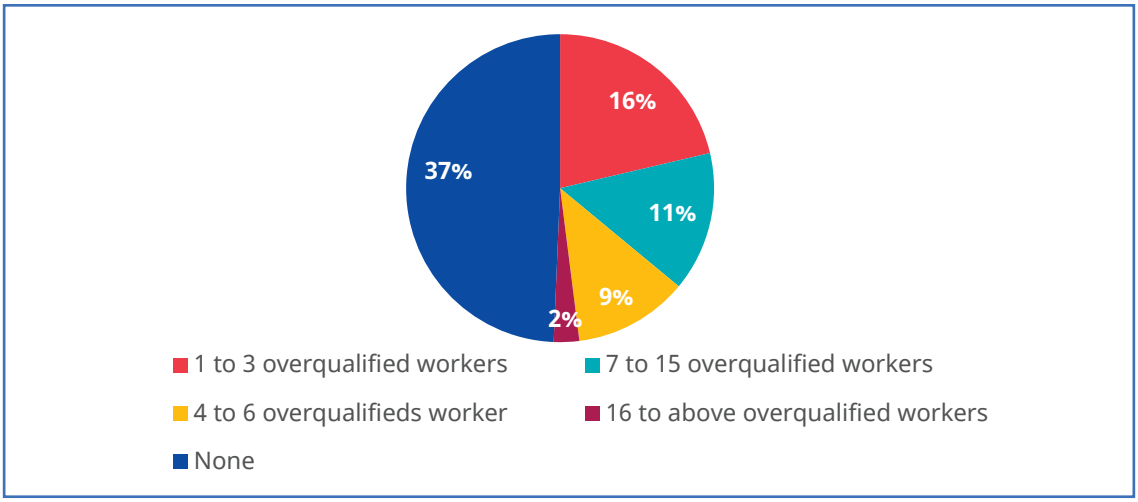


Note: Multiple responses possible. Source: ESS 2023.

4.4.1. Underutilization

Figure 74 illustrates the extent to which the surveyed transport sector enterprises employ workers who are overqualified for their roles. Roughly half of the surveyed enterprises (49 per cent) indicated that they have no overqualified workers. One-third of surveyed enterprises stated that they have either 1 to 3 workers (20 per cent) or 4 to 6 workers (13 per cent) who are more qualified than their job description requires. This suggests that while overqualified personnel are present, it generally affects a relatively small number of employees within individual companies. However, the remaining 17 per cent of enterprises reported having 7 to 15 workers (14.7 per cent) or 16 or above workers (2.7 per cent), which while not as common overall, still suggests that a notable percentage of the transport workforce may not be fully utilizing their qualifications.

▶ Figure 72. Share of workers in surveyed enterprises with qualifications surpassing their job requirements (% of respondents, n=75)

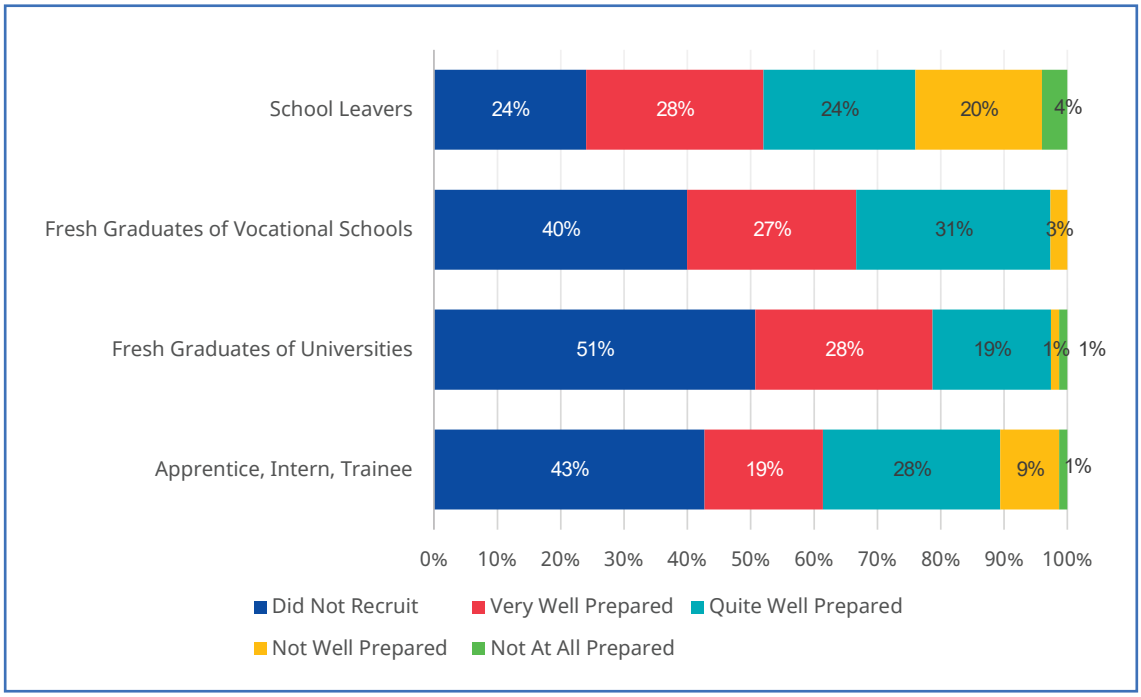


Source: ESS 2023.

4.4.2. New entrants

Figure 75 shows the level of preparation of different types of new entrants in their first transport sector jobs. As with other sectors in covered in this study, transport enterprises are more likely to recruit school leavers than new TVET graduates, new university graduates or apprentices/trainees. As elsewhere, this may reflect a preference for training new workers in house rather than hiring among new graduates from TVET providers and universities. However, school leavers were also much more likely to be viewed as "not well prepared" or "not at all prepared" when compared to new TVET graduates. This might go some way to explaining why new TVET graduates are more likely to be recruited by transport enterprises than in the other sectors covered by this study, wherein a majority of enterprises reported not recruiting new TVET graduates. This may also suggest that TVET programmes related to the transport sector may be more fully aligned with the needs of the enterprises than is seen in other sectors. Even so, new graduates remain at a disadvantage compared to school leavers, suggesting that more needs to be done by TVET providers either to further align curricula with industry needs or to develop better linkages with industry to help graduates secure employment. Another possibility is that new graduates may suffer from over-prioritization of experienced candidates by employers.

▶ Figure 73. Preparedness level of new entrants in their first jobs, by type of new entrant (% of respondents, N=75)



Source: ESS 2023.

▶ 4.5. Workforce development

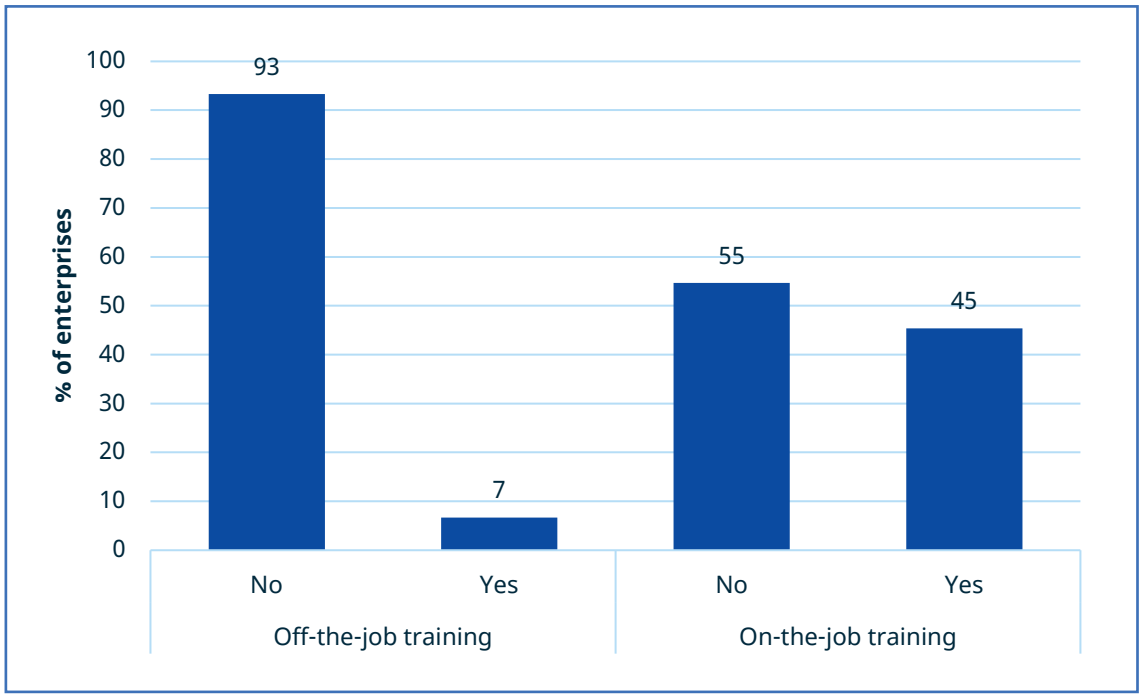
According to the surveyed enterprises, the most widely adopted strategy for addressing proficiency challenges is to increase training and expand trainee programmes, with this being put forward by 60 per cent of surveyed enterprises, making it by far the most commonly provided response (figure 76). This underscores a strong commitment to enhancing employee skills through comprehensive training initiatives. At a distant second, mentoring or coaching schemes were employed by 17 per cent enterprises to provide personalized support and guidance, aiding professional growth. A roughly similar share of enterprises (16 per cent) opt for more supervision and feedback in order to offer ongoing support. Recruitment of new talent (10 per cent) is another approach used to ensure skill requirements are met, and regular appraisals (10 per cent) help assess employee performance and inform targeted training efforts. These strategies collectively reflect the importance of nurturing and enhancing workforce proficiency.

▶ Figure 74. Measures taken by enterprises to overcome challenges related to workers not being fully proficient (% of respondents, N=75)

Note: Multiple responses possible. Source: ESS 2023.

A striking large majority of the enterprises in the transport sector (93 per cent) do not offer off-the-job training, suggesting that this type of training is not commonly utilized within this sector (figure 77). Conversely, when it comes to on-the-job training, almost half of the surveyed enterprises (45 per cent) confirmed that they do offer it. This pattern implies a preference for training that is integrated into daily work activities, allowing employees to learn in a hands-on manner, which is generally considered more practical and directly relevant to their roles. The significant discrepancy between off-the-job and on-the-job training availability could also reflect budgetary constraints, a belief in the effectiveness of experiential learning, or the operational challenges of taking employees out of the work environment for training purposes.

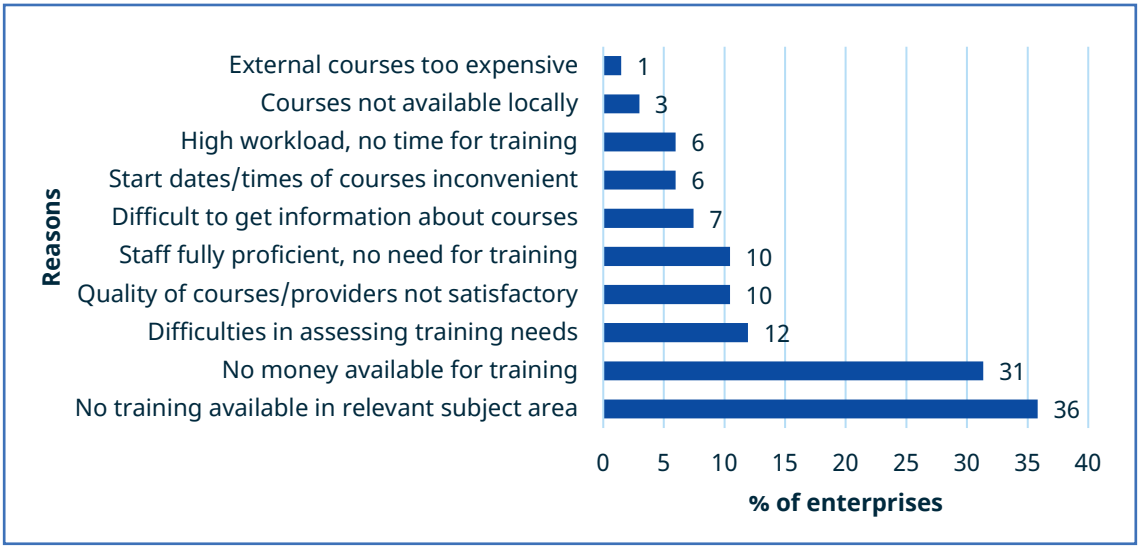
▶Figure 75. Enterprises' support for job training in last 12 months (% of respondents,



Source: ESS 2023.

Figure 78 depicts the various reasons offered by transport sector enterprises for not providing or funding education or training. The most prevalent reason identified was due to the unavailability of relevant training in the subject areas (36 per cent of enterprises). This not only suggests the scarcity of training but also the lack of accessible information concerning available training. In addition, the tendency for individuals to relying on learning by doing and accompanying senior and experienced people in the sector may also provide less motivation to arrange training. The second-most common reason provided was unavailability of money for training (31 per cent), pointing towards budgetary constraints as a significant barrier to funding employee education. Another concern of note was employers experiencing difficulties in assessing training needs (12 per cent), which may also be related to the aforementioned trend of relying on learning by doing and accompanying senior and experienced people in this sector.

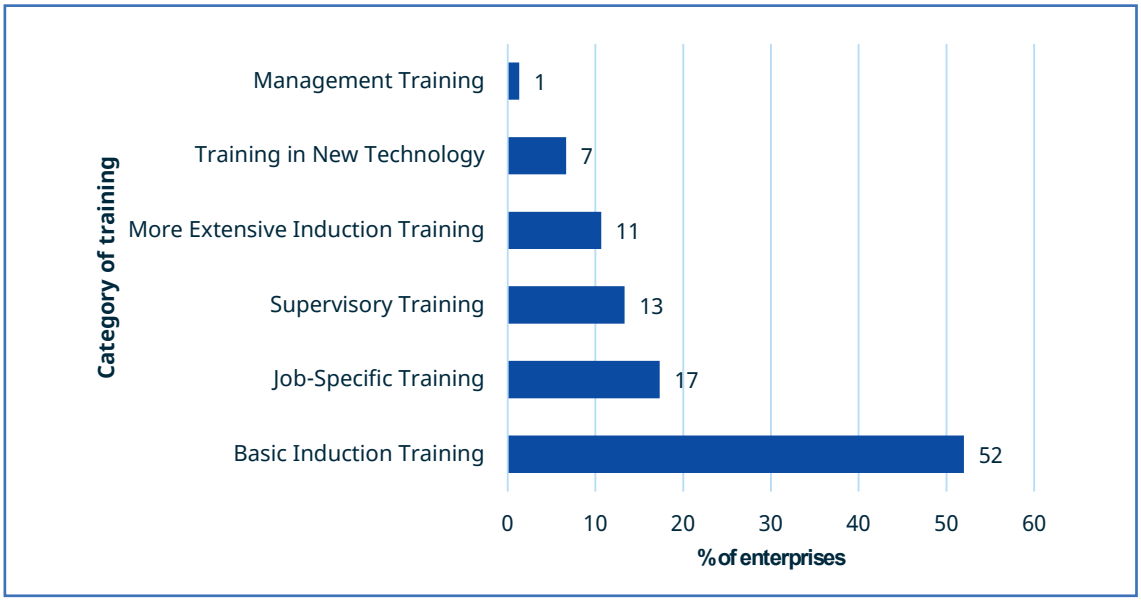
▶ Figure 76. Transportation enterprises' reasons for not providing/funding education or training (% of respondents, N=75)



Note: Multiple responses possible. Source: ESS 2023.

Predominantly, basic induction training is the type of training arranged in the sector, with this being cited by 52 per cent of enterprises, which highlights its fundamental role in acquainting new employees with their work environment and duties (figure 84). Lagging quite far behind the top form of training, the second-most commonly reported training type is job-specific training (17 per cent), illustrating the importance that some enterprises place on equipping employees with the skills necessary to perform their specific roles effectively. In addition, supervisory training and more extensive induction training for new staff were also noted by a significant share of enterprises, which suggests a focus on not only initiating new employees but also enhancing their training as they settle in as well as preparing staff for supervisory roles.

▶Figure 77. Types of training arranged by transportation enterprises (no. of respondents, N=75)

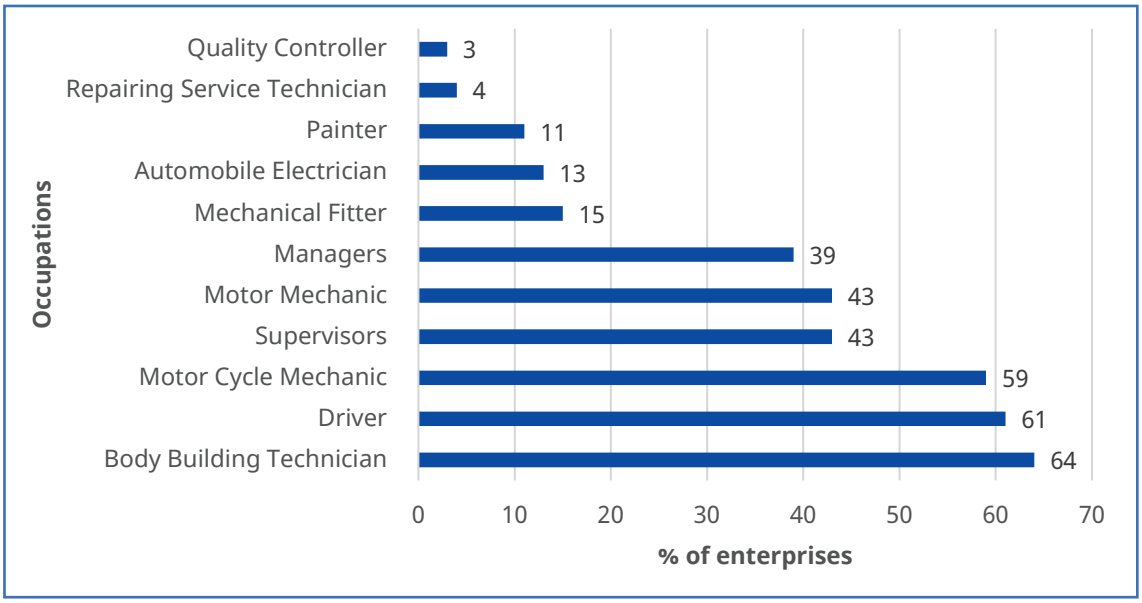


Note: Multiple responses possible. Source: ESS 2023.

▶ 4.6. Future labour and skills demand

The surveyed transport enterprises were asked to name the occupation that they anticipate will be in demand in the future. The responses in figure 80 show that enterprises anticipate a strong need for Body Building Technicians (64 per cent of enterprises), Drivers (61 per cent), and Motorcycle Mechanics (59 per cent). These answers reflect a focus on vehicle maintenance and operation, driven by infrastructure developments in the Chattogram–Cox's Bazar corridor. Supervisors and Motor Mechanics (both 43 per cent) are also anticipated to be in substantial demand, emphasizing the importance of oversight and specialized servicing capabilities. The anticipated demand for Managers (39 per cent) underscores leadership's role in sector growth and adaptation. These anticipated trends emphasize the need for targeted skill development programmes to prepare the workforce for these roles. Training should focus on technical skills for maintenance, operational efficiency, and quality control, while also integrating leadership development in order to meet future supervisory and managerial needs.

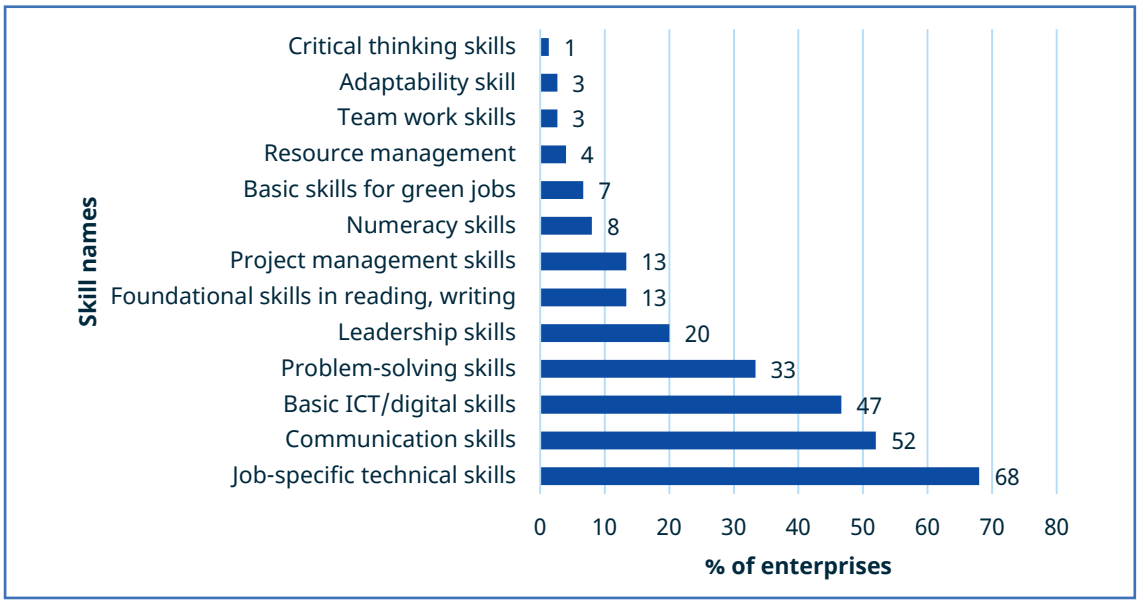
▶ Figure 78. Occupations that will be in demand in the future, according to transport enterprises (% of respondents, N=75)



Note: Multiple responses possible. Source: ESS 2023.

Figure 81 provides an overview of the skills that transport enterprises expect to be in high demand in the near future. Job-specific technical skills were the most commonly supplied answer (68 per cent of enterprises), highlighting the industry's need for specialized knowledge directly applicable to the various functions within the sector. This underscores the importance of industry-specific training programmes that are closely aligned with occupational requirements. Communication skills were the second-most common response (52 per cent), emphasizing the sector's recognition of the need for clear and effective information exchange in a field where coordination is key. Basic ICT/digital skills are also anticipated to be in significant demand (47 per cent), reflecting the industry's move towards digitalization and the need for a workforce that is proficient with technology. Problem-solving skills and leadership skills were also identified as being critical as the sector moves forward, which suggests a need for a workforce that can navigate complex challenges and lead teams effectively.

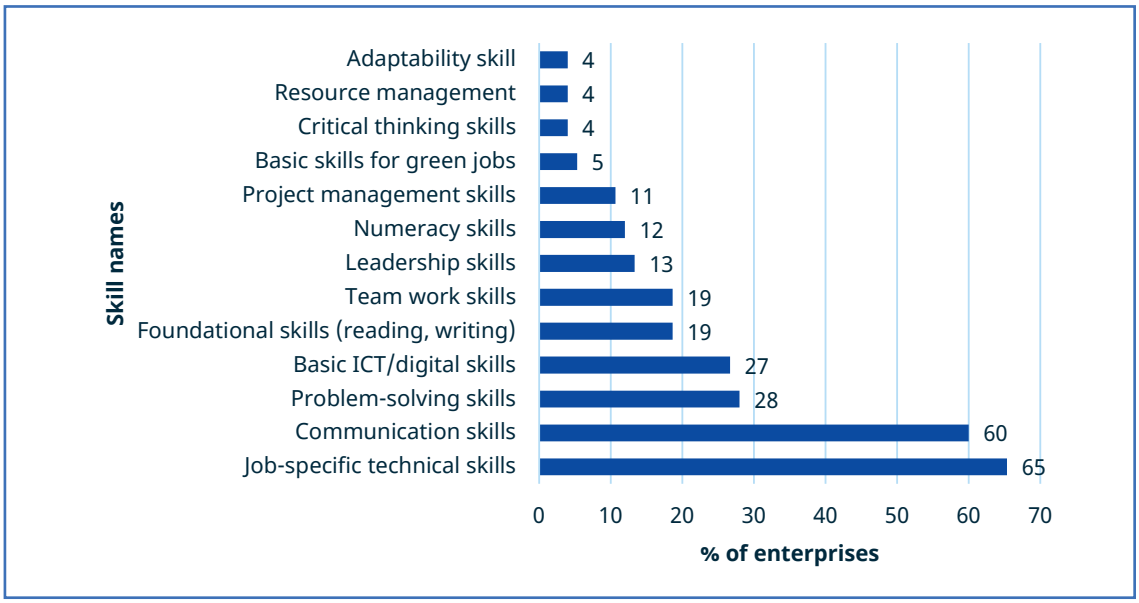
▶ Figure 79. Skills that will be in demand in the future, according to transport enterprises (% of respondents, N=75)



Note: Multiple responses possible. Source: ESS 2023.

Surveyed enterprises were asked to name the skills that will be in demand specifically in the next 2 or 3 years. As in figure 81 above, the results indicate that job-specific technical skills (65 per cent of enterprises) are projected to be the most in demand in the coming years, emphasizing the need for specialized expertise within the transport sector (figure 82). Close behind are communication skills (60 per cent), reinforcing the sector's recognition of the importance of effective information exchange and interaction in an industry reliant on coordination. Problem-solving (28 per cent) and basic digital skills (27 per cent) are also featured prominently, aligning with the sector's trajectory towards increased digitalization and the use of technology in various operational aspects. Foundational skills and teamwork skills are given equal weight by the surveyed enterprises (19 per cent), highlighting the sector's need for a workforce capable of being adaptable and working as part of a team. In response to these findings, the transport sector should prioritize the development of comprehensive training programmes that encompass these diverse skill categories. Emphasis should be placed on creating curricula that balance job-specific technical training with the development of digital, communication and problem-solving skills.

▶ Figure 80. Categories of skills that will be in demand in the next 2–3 years (% of respondents, N=75)



Note: Multiple responses possible. Source: ESS 2023.

▶ 4.7. Vision for the future of the sector

A vision statement has been developed for the transport sector in the Chattogram–Cox's Bazar region to envision the future of the sector. The statement has been crafted incorporating the opinions and validation from relevant stakeholders from the sector. The development of the vision statement included the following steps:

- 1. Opinions from the sector stakeholders regarding what they want the sector to be in future were gathered. The stakeholders included industry experts, business enterprises, and employers' and workers' associations.
- 2. Based on the opinions, a draft vision statement was formed based on the following guiding principles:
    - sector policy availability and implementation;
    - domestic and international markets for the sector;
    - the sector's competitiveness in terms of: product and service quality, adherence with compliance measures, maintaining local and global standards, and ensuring the use of environment-friendly industrial processes;
    - technology usage and adaptation;
    - overall human resource development for all levels of employees;
    - skill development of the sector's workforce, including recognition of formal technical training;
    - higher education for transport sector workers; and
    - peace building and conflict mitigation among stakeholders of the sector.

3. The draft vision was articulated to the major stakeholders to validate.
4. After incorporating the feedback from the stakeholders, the vision statement was developed as follows:

The vision statement for the transport sector of the Chattogram–Cox's Bazar region

We have a vision for the future where the transport sector in Chattogram and Cox's Bazar thrives, maintaining its strong contribution to national GDP and connectivity. Our objective is to excel in providing an extensive range of innovative, high-quality transportation services, while also caring for the environment and social challenges, and giving top priority to the safety and well-being of our workforce.

Our vision will be fueled by a skilled, technologically adept and knowledgeable workforce. We understand the need to adopt digitalization, with our ultimate goal being the smooth integration of technology and automation into our transportation activities. This integration will not only generate job opportunities but also enhance skills development in the region.

To turn this vision into a reality, we expect substantial government and donor support, including in the development and implementation of comprehensive transportation and business policies, as well as the establishment of dedicated transportation hubs and infrastructure. Collectively, we aim to shape a future where the transport sector in Chattogram and Cox's Bazar stands as a source of pride and plays a crucial role in the local and national economies.

This vision will be achievable if all the major stakeholders in the sector come together and engage in strong collaboration and cooperation with each other.

▶ 4.8. Gaps in the capabilities and skills needed to achieve the vision for the future

Bangladesh is experiencing significant growth in its transportation sector, driven by various connectivity projects initiated by the government. The sector is primed for expansion and enhancement. However, addressing certain skill and capability challenges is paramount. Once these issues are rectified, the sector has the potential to elevate its offerings and provide a wider range of services.

Identifying capability gaps

Business organizations in transport sector often lack a long-term vision to capitalize on future opportunities within this sector. There's an apparent hesitancy to fully embrace modern technologies such as electric vehicles (EVs). Additionally, businesses frequently adhere to inadequate maintenance practices. Challenges like ineffective marketing strategies, limited outreach efforts and inappropriate pricing policies further hinder the sector's growth potential. To pave the way for the envisioned future, it is imperative to first identify the current gaps in business capabilities within the transport sector. These include:

- **Technological integration:** The sector currently lacks the full integration of advanced technologies such as AI, the Internet of Things and data analytics, which are essential for optimizing operations and improving decision-making processes.
- **Sustainable practices:** There is a need for greater emphasis on sustainable transport solutions that minimize environmental impact, a gap that must be closed to meet global sustainability standards.
- **Logistic and strategic planning:** Current strategic and logistical planning capabilities need enhancement to manage the complexities of a rapidly expanding economic corridor effectively.

Skill gaps

When it comes to skill discrepancies, there is a consistent lack of personnel possessing essential technical abilities (such as mechanics and drivers) within the transportation sector. Additionally, deficiencies in soft skills (like customer service and communication) are widespread. Conversely, employers encounter challenges in retaining proficient staff due to factors like inadequate wages, unfavourable working conditions, or limited avenues for career advancement, exacerbating the skills gap in this field. Fundamental skills such as literacy, adaptability and critical thinking have narrower gaps but remain crucial for meeting evolving industry demands and promoting a culture of ongoing enhancement and creativity. Some additional skill sets required to bridge these capability gaps include:

- **Digital proficiency:** A workforce skilled in the latest digital tools and platforms is necessary to harness the power of technology for efficiency gains.
- **Green skills:** As the sector moves towards more environmentally friendly practices, skills in green technology and sustainable practices will become increasingly valuable.
- **Advanced management skills:** Strategic management skills, including change management and supply chain optimization, are required to navigate the future landscape of the transport sector.

Bridging the gaps

The following measures are recommended to bridge these gaps:

- **Investment in technology:** Commit to investing in new technologies, and provide training for the workforce to use these technologies effectively.
- **Sustainability training:** Incorporate sustainability as a core component of all training programmes and operational protocols.
- **Enhanced education programmes:** Work with academic institutions to ensure that the education provided is aligned with the future needs of the sector, focusing on strategic management and technological skills.
- **Continuous professional development:** Encourage continuous professional development and lifelong learning among the workforce to maintain a dynamic and adaptable skill set.
- **Enhanced technical education:** Broaden TVET programmes to enhance the skill sets of workers in specialized areas that align with emerging transportation technologies.
- **Development of communication skills:** Introduce training modules aimed at enhancing communication skills among employees.
- **ICT training initiatives:** Establish and promote ICT training programmes to ensure that the workforce is proficient in utilizing digital tools and platforms effectively.
- **Leadership development programmes:** Create initiatives to develop leadership skills and foster strategic thinking among current and emerging leaders within the sector.
- **Enhancement of fundamental skills:** Integrate foundational skill development, including adaptability and critical thinking, into all levels of education and training.

Partnerships and collaboration

The realization of this vision will require partnerships between government, industry and educational institutions. These partnerships can facilitate:

- **Policy development:** Collaborative efforts to develop policies that encourage innovation and investment in the transport sector.
- **Shared resources:** Leveraging shared resources for the development of training facilities and programmes.
- **Research and development:** Joint research and development initiatives to stay ahead of technological advancements and industry trends.

The gaps in business capabilities and skills present a significant challenge but also an opportunity for growth and development. By taking proactive steps to bridge these gaps, the transport sector in the Chattogram–Cox's Bazar region can achieve its vision for a future that is technologically advanced, sustainable and capable of supporting the region's economic growth.

▶Table 18. Skills needed to address major business capability gaps in the transport

Capability gap	Skills needed to address gap	Related occupations
Logistics and strategic planning	▶ Skills on distribution design and management ▶ Skills on analytical thinking ▶ Skills on lean and agile logistics	▶ Mechanical Fitters, ▶ Managers, ▶ Supervisors
Adaptation of new technology	▶ Skills on machine operation and maintenance	▶ Mechanical Fitters, ▶ Automobile Assemblers, ▶ Drivers, ▶ Motorcycle Mechanics, ▶ Machine Shop Technicians, ▶ AC Technicians, ▶ Auto Electricity Technicians, ▶ Marine Diesel Engine Mechanic
Compliance issues	▶ Skills on waste management ▶ Skills on occupational safety and health (OSH) ▶ Skills on decent work and labour rights	▶ Drivers, ▶ Managers, ▶ Supervisors
Research and development	▶ Skills on process innovation ▶ Skills market development	▶ Research Associate

▶ 4.9. Skills supply findings

4.9.1. Supply of skills

Table 18 below provides and overview of the transport-related training programmes available in TVET providers in the Chattogram Region and Cox's Bazar.

▶ Table 19. Available transport sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level

Programme level	Trade/specialization programmes available	
	Chattogram region	Cox's Bazar
Diploma	Automobile Technology Marine Technology	
SSC (Voc)	Automotive	Automotive
NSC (Levels 1–5)	Auto Mechanics Automotive Machine Auto Electricity Servicing Motorbike Servicing Driving Machine Tools Operation	Motor Driving and Maintenance
Informal certificate course	Automotive Mechanics Mechanist Driving Manual Driving Auto Driving Diesel Mechanics Cycling Motor Bike Driving Motor Driving and Maintenance Scooty Driving	Driving Motor Driving and Maintenance

The table indicates that the number of courses available for the transport sector is relatively lower than for other priority sectors, especially in Cox's Bazar. There is rather few transport-sector related courses at every level of certification. This is even true for informal certificate courses, which stands in rather sharp contrast with the other priority sectors, which generally have an abundance of informal course options. It should also be noted that there is no transport-related course available at the diploma level in Cox's Bazar.

4.9.2. Typical career pathways within the sector

For the transport sector occupations can be categorized into four groups: (i) managerial; (ii) technical; (iii) operational; and (iv) administrative. For each group of occupations, the qualifications are different.

For entry-level managerial positions, one may have to achieve a bachelor's or master's degree as an educational qualification.

For a technical position, such as Automobile Technician or Quality Assurance Officer, one needs to have a bachelor's degree or a diploma degree in engineering. These position holders will be responsible for conducting mechanical activities and repairing services.

In operational positions, most of the workforce are floor-level employees responsible for machine operation. Employees for these positions may need to have HSC or SSC certification or an NSC skills certificate equivalent to level 2 or 3. Those who have informal certification may also find a way to enter into these positions. Moreover, those who do not have any certification but have gained technical experience by doing jobs can also be qualified for a position in this category of occupations. These positions may include Diesel Mechanic, Machinist, Welder, Motorcycle Repairer, and so on.

For entry-level administrative positions, a bachelor's or master's degree is preferred. Because less technical knowledge is required for these roles, diploma holders will find it difficult to utilize their TVET education for these occupations. However, in some cases, skills certificates can be helpful to get a job in this occupation category, such as basic computer certification for an Accountant.

4.9.3. Types of TVET providers surveyed

Table 19 below provides information on the availability of TVET courses related to transport in the Chattogram region and Cox's Bazar. This information was gathered during the data collection phase from TVET providers survey. It is observed that Chattogram region has substantially more surveyed providers offering transport-related courses than Cox's Bazar (50 versus 7).

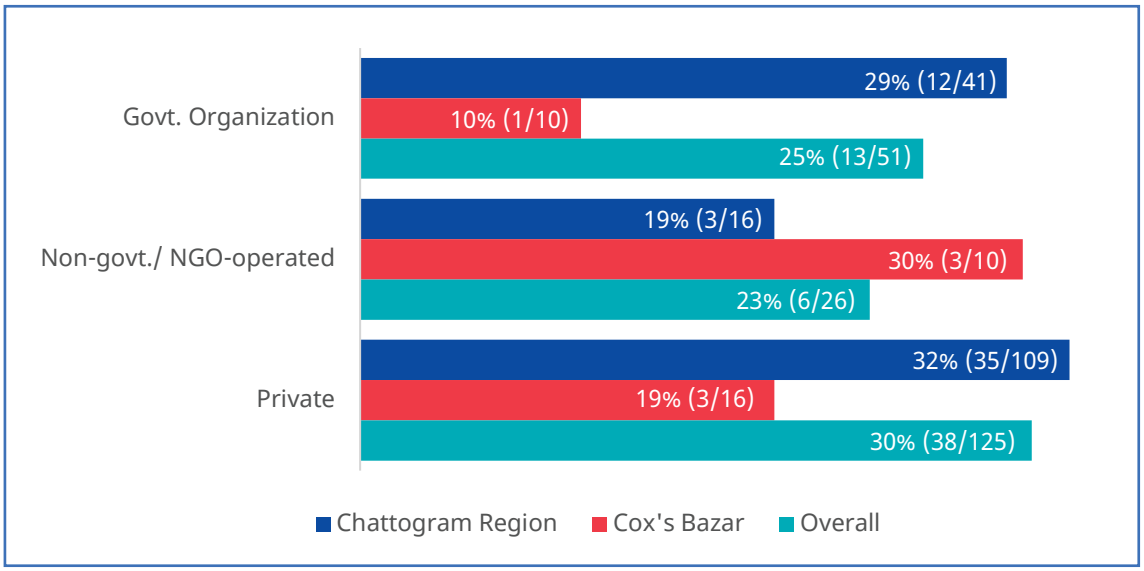
▶Table 20. Share of surveyed TVET providers offering transport-related courses

Region	No. of TVET providers surveyed	No. of transport-related courses available
Chattogram region	166	50
▶ Government-operated	41	12
▶ Non-govt/NGO-operated	16	3
▶ Private	109	35
Cox's Bazar	36	7
▶ Government-operated	10	1
▶ Non-govt/NGO-operated	10	3
▶ Private	16	3

Source: Survey with TVET providers.

Figure 83 shows a visualization of the information contained in table 19, allowing one to get a better sense of the share of TVET providers offering transport-related courses.

▶ Figure 81. Prevalence of transport-related courses in surveyed TVET providers, by owner/ operator of the provider (%)

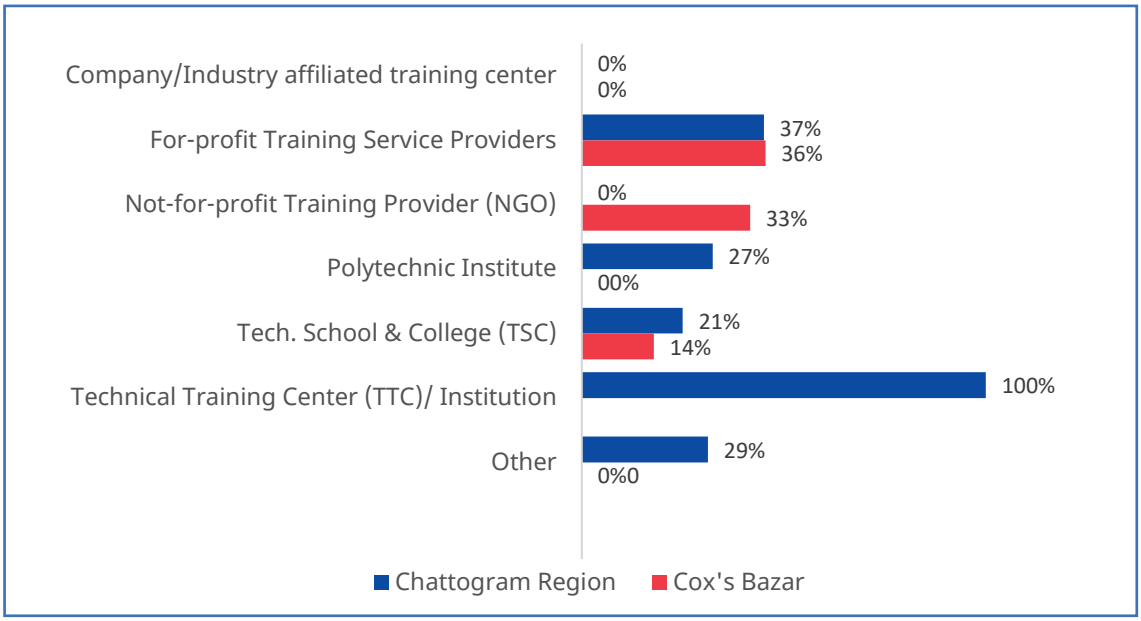


Source: Survey of TVET providers.

Overall, 25 per cent of the government-run providers that were surveyed offer transport courses, with this also being the case for 23 per cent of NGO-operated providers and 30 per cent of private TVET providers. However, there are some courses (such as Electrical Installation and Maintenance) that can be attributed to different sectors, such as construction, light engineering, and so on. These types of courses were excluded from consideration in this chapter on the transport sector. As a result, the table and figure above may show a lower number of providers of transport-related courses than there are in reality.

By type of TVET provider, it was found that all of the surveyed TTCs in the Chattogram region have transport-related TVET courses. A small share of TSCs have such courses on offer: only 14 per cent in Cox's Bazar and 21 per cent in the Chattogram region. It is important to mention here that none of the company-affiliated training centres surveyed are providing transport-related courses in either of the regions. On the other hand, for Cox's Bazar, one-third of the not-for-profit training providers surveyed provide training courses related to the transport sector. While in the Chattogram region, none of the not-for-profit TVET providers surveyed offer any courses targeting the transport sector.

▶Figure 82. Prevalence of transport-related courses in different types of TVET providers

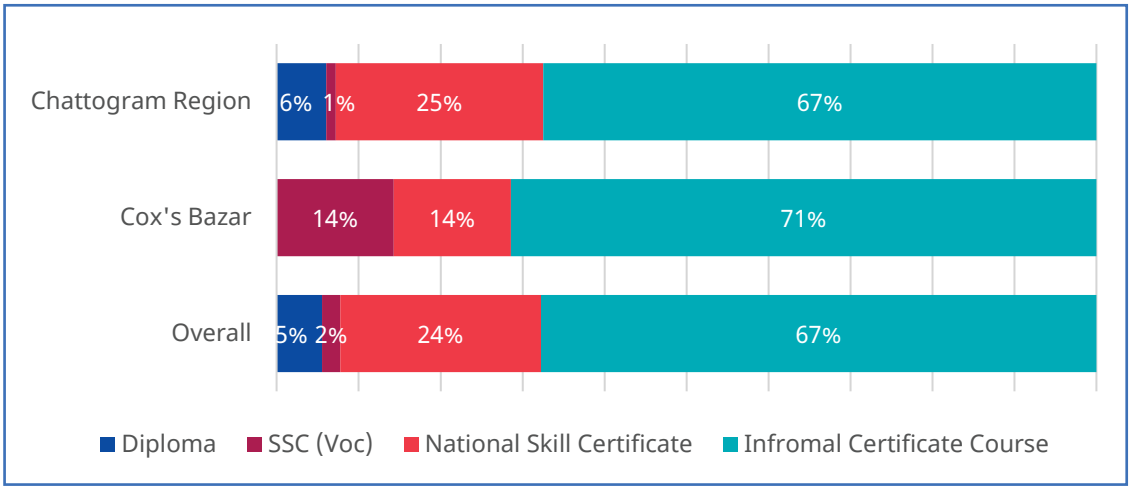


Source: Survey of TVET providers.

4.9.4. Level of skills programmes available

As mentioned above, Cox's Bazar has a lower number of courses related to the transport sector compared to the Chattogram region. In terms of programme availability for the transport sector, providers offering informal certificate courses are predominant in both the Chattogram region and Cox's Bazar (67 per cent overall), followed by NSC courses (24 per cent overall). However, only one provider offers transport-related courses at the SSC (Voc) level in Cox's Bazar, and the same is true for the Chattogram region. There is no HSC (Voc) level course related to this sector in both Cox's Bazar and Chattogram region. There is no diploma-level programme available in Cox's Bazar, although transport-related diploma courses are offered by a small number of providers in the Chattogram region. There is a need for more transport-related courses in both Chattogram and Cox's Bazar.

▶Figure 83. Level of the transport-related skills programme available (%)



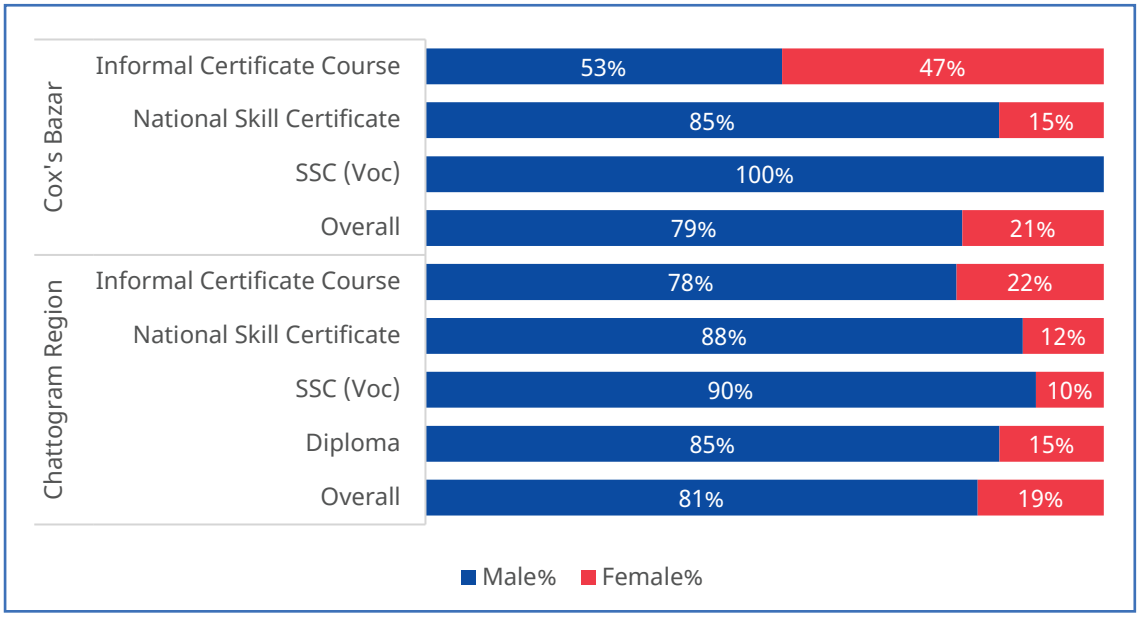
Source: Survey of TVET providers.

4.9.5. Enrollment status by sex

In the Chattogram region, males trainees have a dominant presence in transport related courses (81 per cent). Females trainees are most likely to be found in informal courses, but at 22 per cent they are still strongly outnumbered. The main trades for female students include driving, scooter driving, cycling, motorbike driving, and so on. It was also noticed by the study team that there are specific informal providers that run courses only for female trainees. Among formal programmes, diploma courses, such as automotive and marine technology, have a higher female presence (15 per cent) than SSC (Voc) and NSC courses.

Cox's Bazar displays a similar situation, as more than three-fourths of the students in transport-related courses are males (79 per cent). However, at 47 per cent, females have a strikingly better presence in informal programmes compared to the Chattogram region (where it is just 22 per cent). The high level of female enrollees in informal programmes compared to formal courses is because of female students' interest in learning driving skills. It is also due to the fact that a few NGOs in Cox's Bazar offer coursed targeted at female learners, including transport-related courses. However, there was no female enrollment in SSC (Voc) level courses.

▶ Figure 84. Ratio of male and female trainees enrolled status in transport-related programmes, by training programme level



Source: Survey of TVET providers.

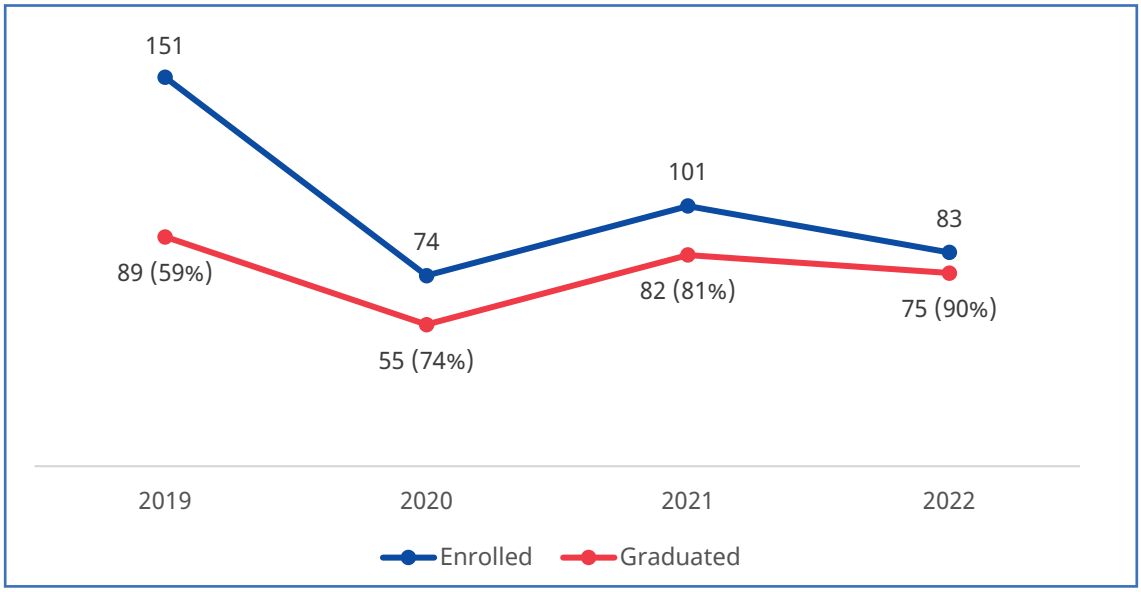
4.9.6. Number of graduates

The number of graduates over the 2019–22 period was extracted from the official portal of the BTEB. Figures 87 and 88 below demonstrate the enrolment and graduation trend for transport-related HSC (Voc), SSC (Voc), Dakhil (Voc) and 360-hour short courses. Sector-specific graduation data at the diploma level could not be extracted.

It can be observed that unlike the other priority sectors considered in this study, the number of enrolments and graduations in transport-related courses have been gradually decreasing. In the Chattogram region, 573 trainees graduated from transport-related courses in 2019, whereas only 231

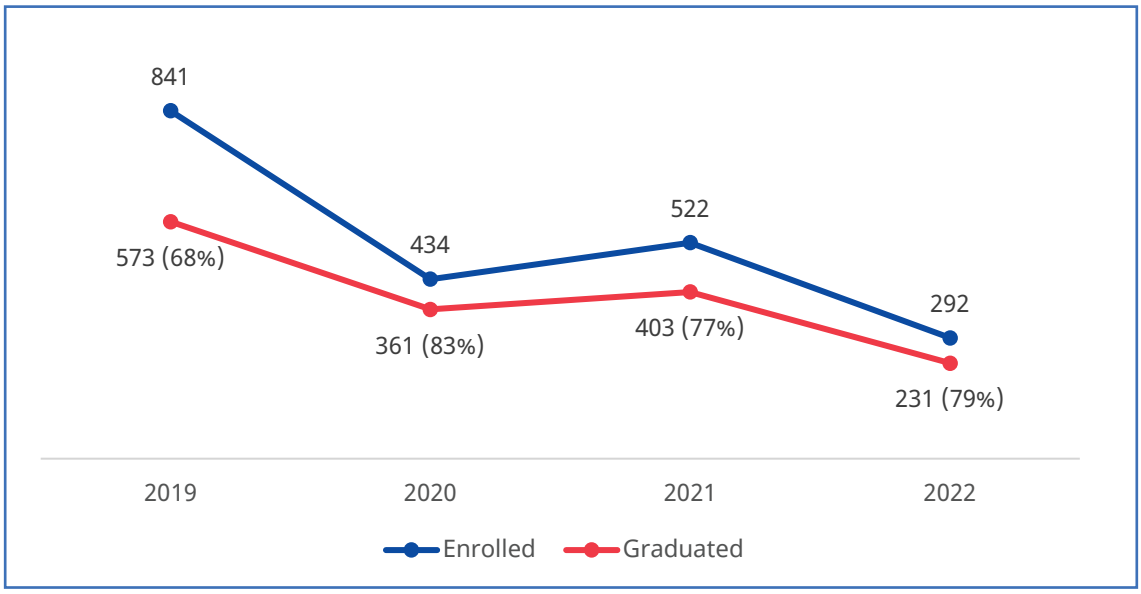
graduated in 2022. The scenario is almost the same in Cox's Bazar, with 89 trainees graduating in 2019, but the number fell to 75 in 2022. There was a particularly sharp decline in graduate numbers in 2020 during COVID-19.

▶ Figure 85. Enrolment and graduation numbers for transport-related programmes in Cox's Bazar, 2019–22



Source: Survey of TVET providers.

▶ Figure 86. Enrolment and graduation numbers for transport-related programmes in the Chattogram region, 2019–22

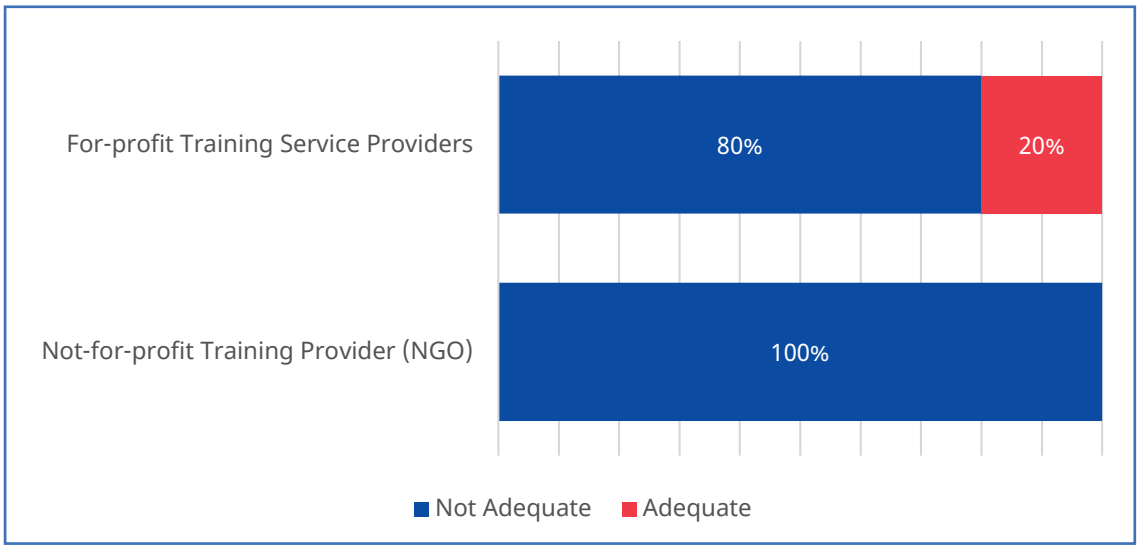


Source: Survey of TVET providers.

4.9.7. Adequacy of TVET providers' equipment

Figure 89 shows the adequacy of the equipment used by TVET providers for transport-related courses. According to TVET providers surveyed, all of the not-for-profit providers said they do not have adequate equipment for transport courses. Because NGOs run courses based on donor funding, they typically buy or outsource equipment on a need basis, and as a result, they often do not own equipment permanently. Among the for-profit training providers, only 20 per cent stated that they have adequate equipment available for trainees in transport courses.

▶ Figure 87. Adequacy of training equipment in transport-related training programmes, by type of TVET provider (%)



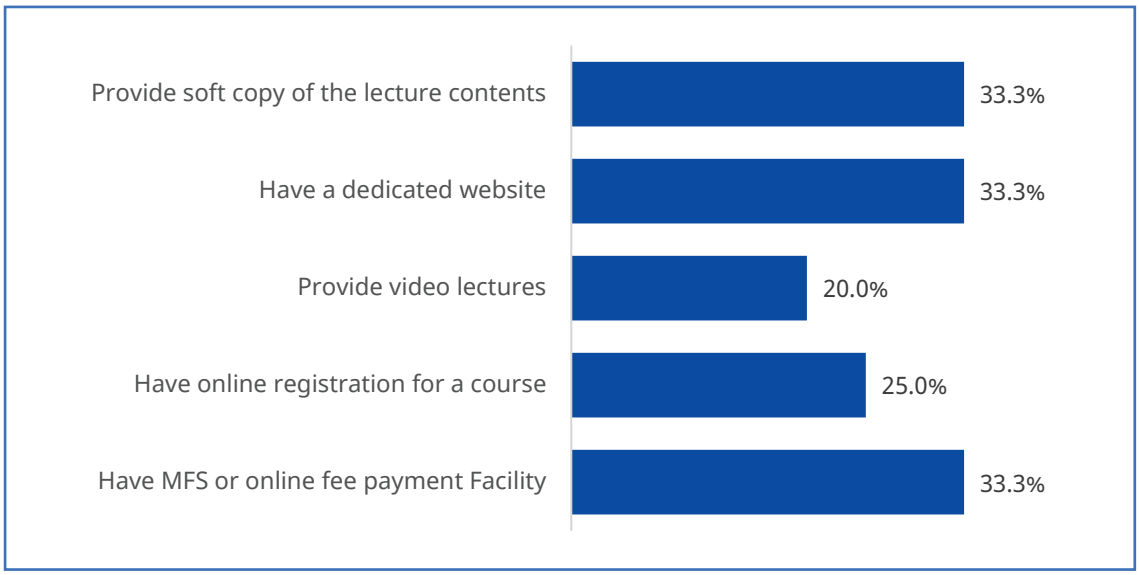
Source: Survey of TVET providers.

4.9.8. Digitization of TVET services

In the Chattogram–Cox's Bazar region, very few TVET providers offer digital services related to transport courses. The most commonly noted digital services include having websites, providing soft copies of lectures, and providing video lectures – but no digital service was offered by more 33 per cent of providers. Only 20 per cent of the TVET providers facilitate video lectures, likely at least in part because the transport sector requires mostly hands-on experience and training. One-third of the TVETs (33 per cent) have their own website, which ultimately helps to bridge information gaps faced by potential students.

Mobile Financial Services (MFS) or online money transfers have become a burning need for every sector. However, only one-third of the TVET providers providing transport-related courses can accept course fees via mobile banking or online banking.

▶ Figure 88. Digitization status of TVET providers in regard to transport sector-related programmes (%)



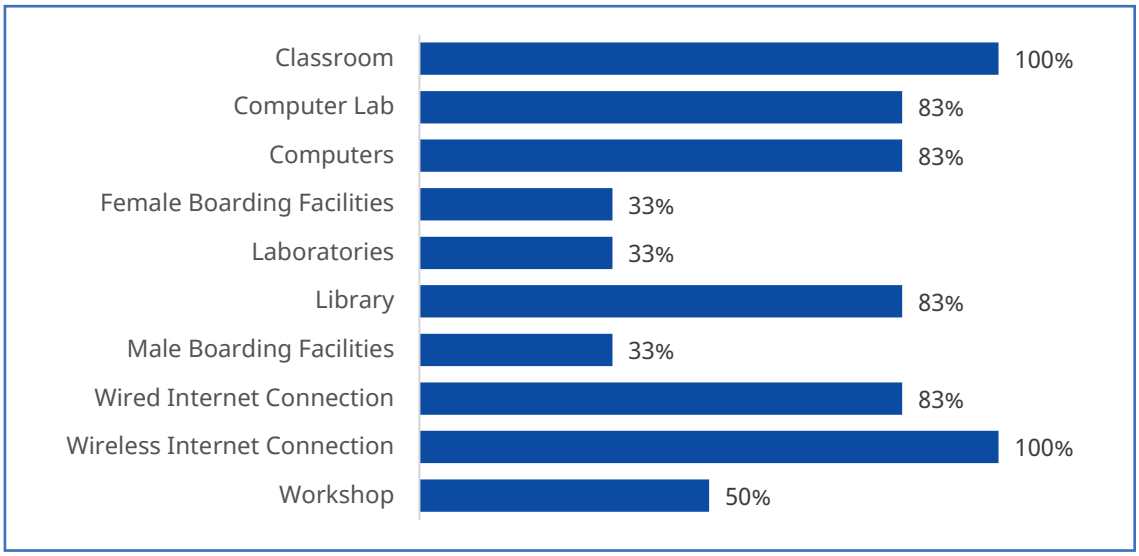
Source: Survey of TVET providers.

4.9.9. Status of facilities available at TVET providers

Figure 91 presents some commonly required facilities for TVET providers and the prevalence of these facilities in the TVET providers offering transport-related courses. All the TVET providers offering transport courses have wired or wireless internet connections. Most also have computer labs, as most of the TVET providers also offer ICT courses.

More importantly, one-third of the TVET providers (33 per cent) have boarding facilities for their trainees, both male and female. However, the boarding facility is not dedicated only to transport course trainees. Furthermore, most government-run TVET providers offer boarding facilities. However, most of the TVET providers raised concerns about the scarcity of facilities. According to them, if they can expand their facilities, they can accommodate more trainees and deliver higher quality training.

▶ Figure 89. Facilities available in TVET providers offering transport sector-related programmes (%)



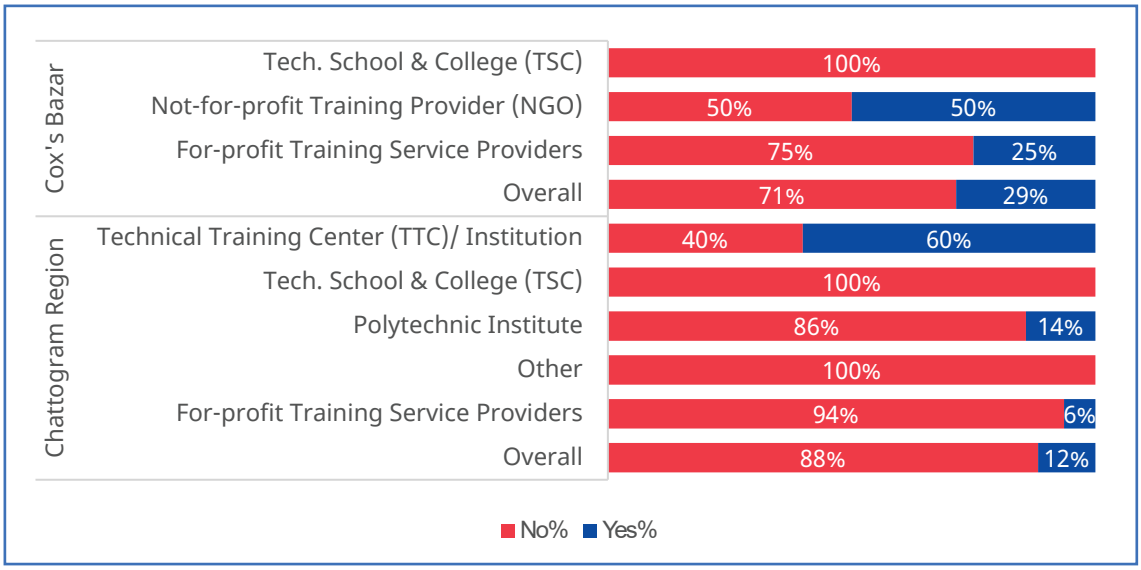
Source: Survey of TVET providers.

4.9.10. TVET providers' capacity to provide Recognition of Prior Learning

In the transport sector, most workers gain knowledge and experience through working in the informal sector, but they generally need certification to get a job in formal enterprises. However, as seen in figure 92, RPL systems for transport-related programmes are not particularly widespread in the Chattogram–Cox's Bazar region. Overall, a greater share of TVET providers in Cox's Bazar have RPL systems than among providers in the Chattogram region (29 per cent versus 12 per cent).

In Cox's Bazar, half of the bot-for-profit TVET providers (50 per cent) mentioned having active RPL programmes. However, there is no chance of RPL at the TSC institutes in Cox's Bazar. In the Chattogram region, however, a majority of TTCs offer RPL (60 per cent), followed by polytechnic institutes (14 per cent). Industry insiders urged for more RPL systems within TVET providers to incorporate and certify more skilled workers.

▶Figure 90. Status of transport-related RPL offerings in TVET providers, by type of provider (%)

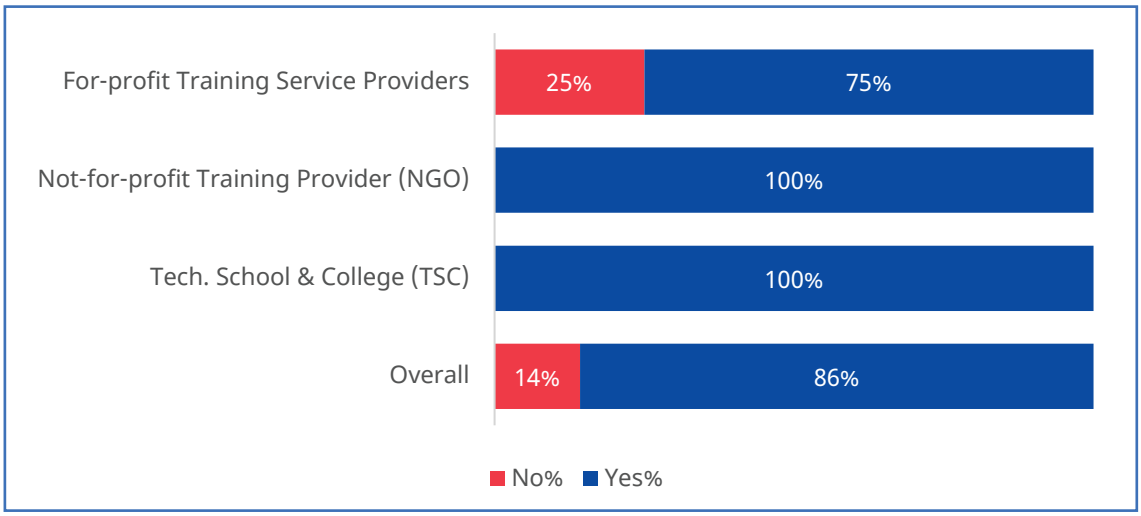


Source: Survey of TVET providers.

4.9.11. TVET provider collaborations/linkages with CBOs, NGOs and social organizations

Most of the TVET providers (86 per cent) in the Chattogram–Cox's Bazar region reported having linkages with CBOs, NGOS, and/or social organizations. All of the TSCs and not-for-profit providers stated that they are collaborating with CBOs/NGOs. However, the for-profit training providers fall slightly behind in terms of maintaining collaborations with the local communities and organizations. This is because of the fact that NGO-operated providers generally have closer relationships with CBOs and social organizations, even attract potential trainees from them.

▶ Figure 91. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on transport-related programmes (%)



Source: Survey of TVET providers.

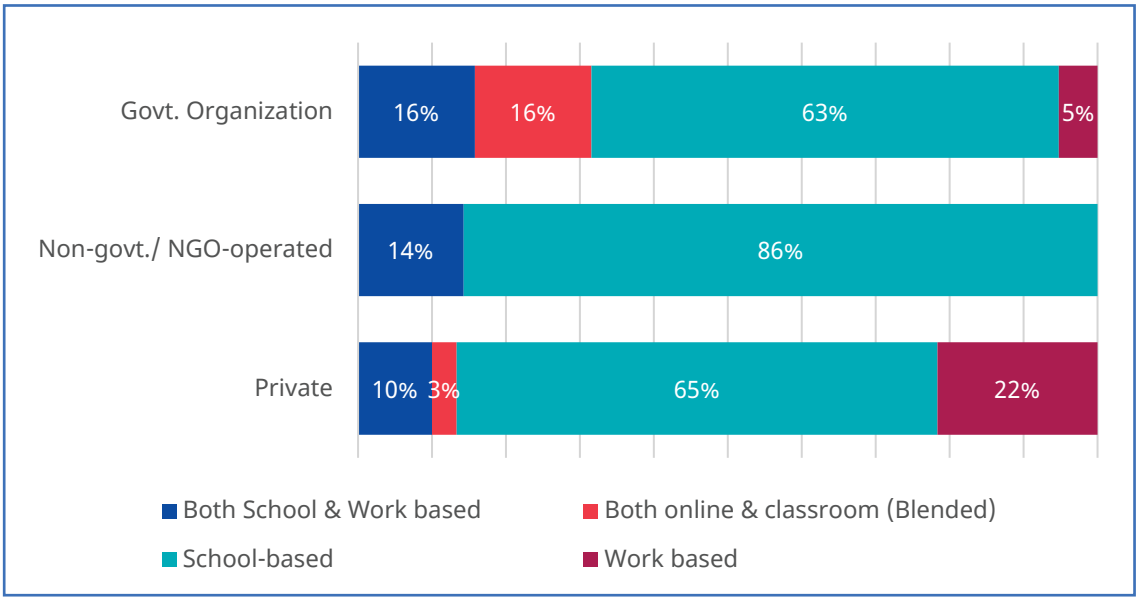
4.9.12. Share of TVET providers with placement cells for graduates

When it comes to placement cells for the transport sector, strikingly, no TVET providers in the region – including TSCs, NGOs, and for-profit training providers – have them. TVET providers offering transport-related courses clearly need to update their services to incorporate placement cells, both to support graduates and to possible attract NEET youth to enroll in transport-related courses.

4.9.13. Course delivery mechanisms

In terms of delivering courses, classroom-only learning is the most common delivery method for government-run providers (63 per cent), NGO-operated providers (86 per cent), and private providers (65 per cent). Moreover, combined classroom and work-based training is the second-most common delivery method, found in 16 per cent of government-run providers, 14 per cent of NGO-operated providers, and 10 per cent of private providers. Interestingly, solely work-based training is provided in 22 per cent of private providers and 5 per cent of government-run providers – an arrangement that is largely not seen in courses targeting other sectors (except agri-food, see section 6.6.12 below). Drawing from the FGDs, it was also found that transport courses generally require more hands-on training, hence the very low prevalence of any online-based training.

▶ Figure 92. Course delivery method for transport sector-related TVET programmes, by owner/operator of the TVET provider (%)

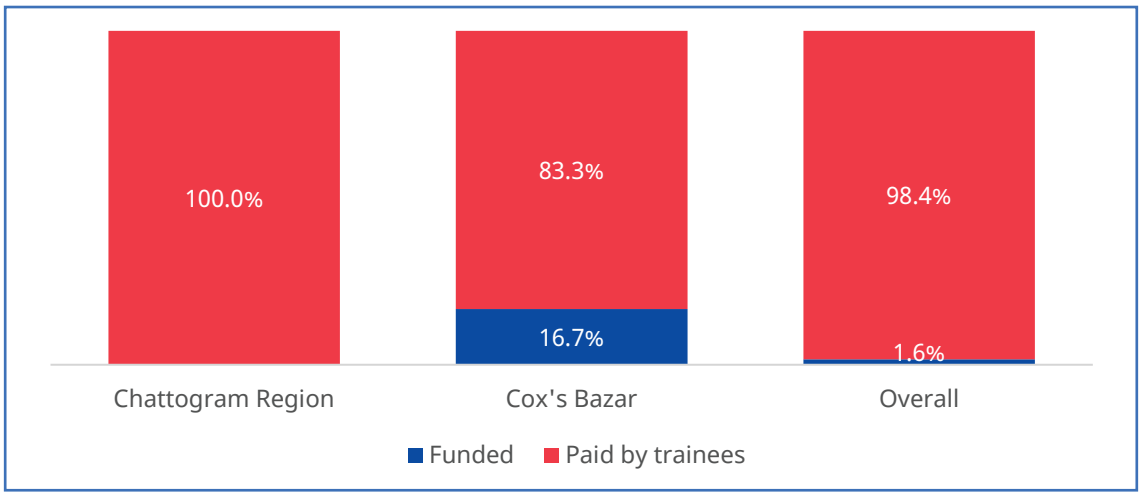


Source: Survey of TVET providers.

4.9.14. Source of tuition fees for courses

The survey with TVET providers offering transport-related courses revealed that for almost all (98.4 per cent) require trainees to pay a tuition fee. For the small remainder (1.6 per cent), government or donor funding bears the tuition costs for the trainee. In Cox's Bazar, 16.7 per cent of courses had their tuition covered by outside funding, but in most cases (83.3 per cent) trainees had to pay a tuition fee. While in the Chattogram region, all courses required the payment of tuition. In most of the government-run TVET providers trainees have to pay a tuition fee, but it generally a very nominal amount. In NGO-operated TVET providers, courses are normally entirely funded by donor agencies, but there are few NGO-operated providers who take tuition fees from trainees.

▶Figure 93. Source of tuition fees for transport-related TVET programmes (%)



Source: Survey of TVET providers.

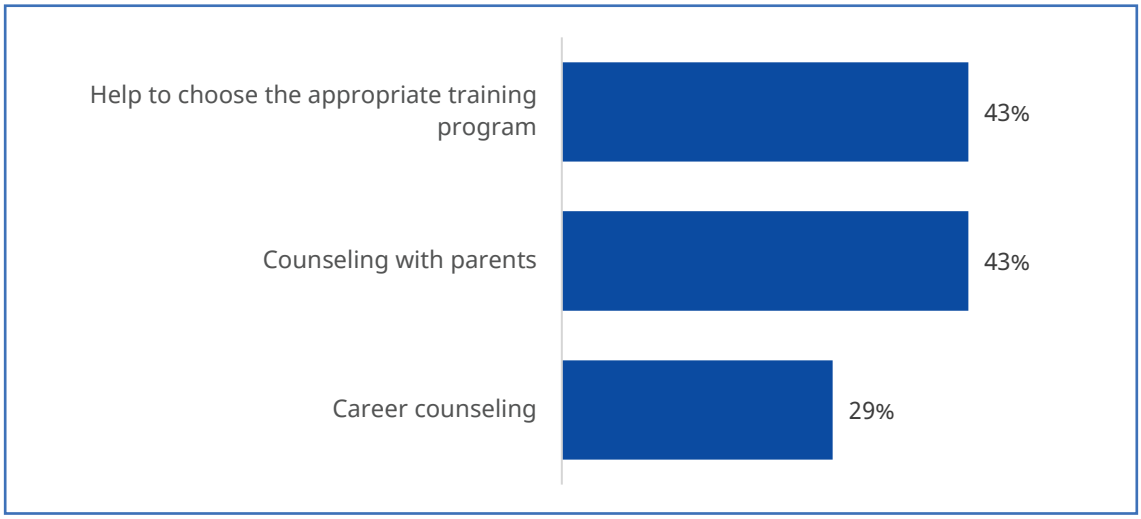
4.9.15. TVET providers' support services

Some TVET providers in the Chattogram–Cox's Bazar region incorporate a few pre- and post-training support services for transport-course trainees, as outlined below:

Pre-training support

The most commonly reported pre-training support services offered were vocational guidance (43 per cent), counseling with parents (43 per cent), and career counseling (29 per cent). However, drawing from FGDs with TVET graduates, it was observed that, they would prefer to have pre-training support services to help them choose the course that best aligns with their career expectations.

▶ Figure 94. Pre-training support services offered by TVET providers with transport-related programmes (%)

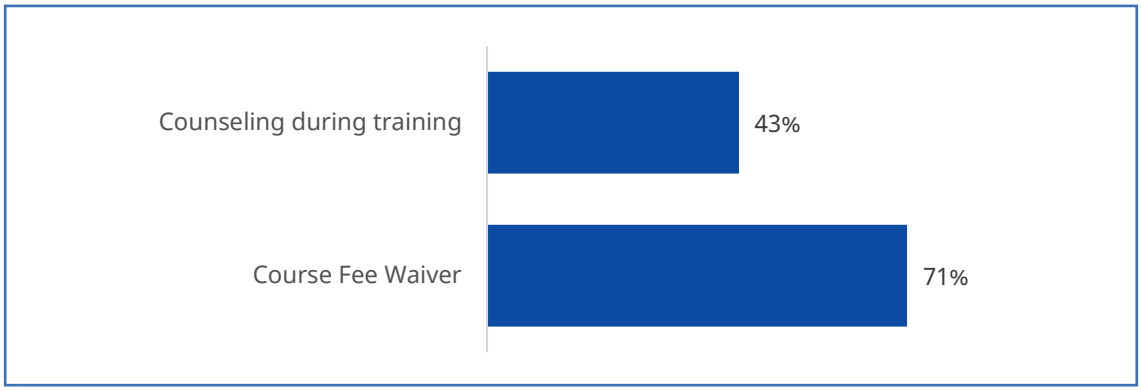


Source: Survey of TVET providers.

During training support

TVET providers also provide some support for trainees during the programme/courses. The most commonly cited support service was counseling during training (43 per cent). Moreover, nearly three-quarters of the providers (71 per cent) said they consider course fee waivers for trainees, if needed. Moreover, a few TVET providers also reported that they conduct motivational sessions for the students, and provide scholarships if they find any suitable individuals.

▶ Figure 95. During training support services offered by TVET providers with transport-related programmes (%)

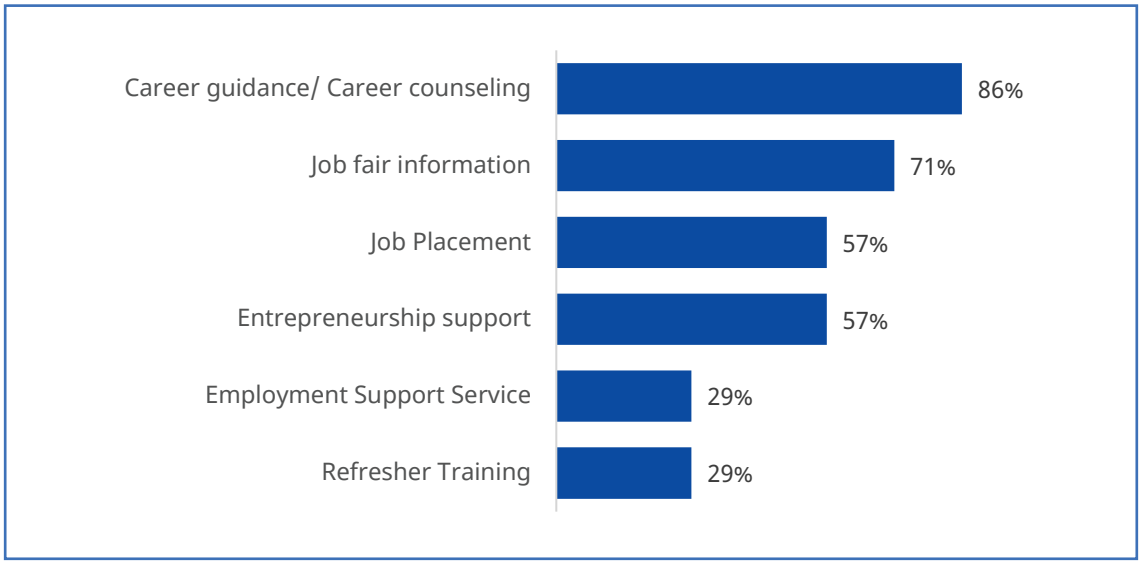


Source: Survey of TVET providers.

Post-training support

The post-training support most commonly cited by TVET providers was career guidance (86 per cent). a majority of TVET providers also said they try to arrange jobs for graduate trainees (57 per cent), if any opportunities are available. Moreover, entrepreneurship support (57 per cent), employment support services (29 per cent), and refresher training (29 per cent) were reported by some TVET providers as being available to transport course trainees.

▶ Figure 96. Post-training support services offered by TVET providers with transport-related programmes (%)

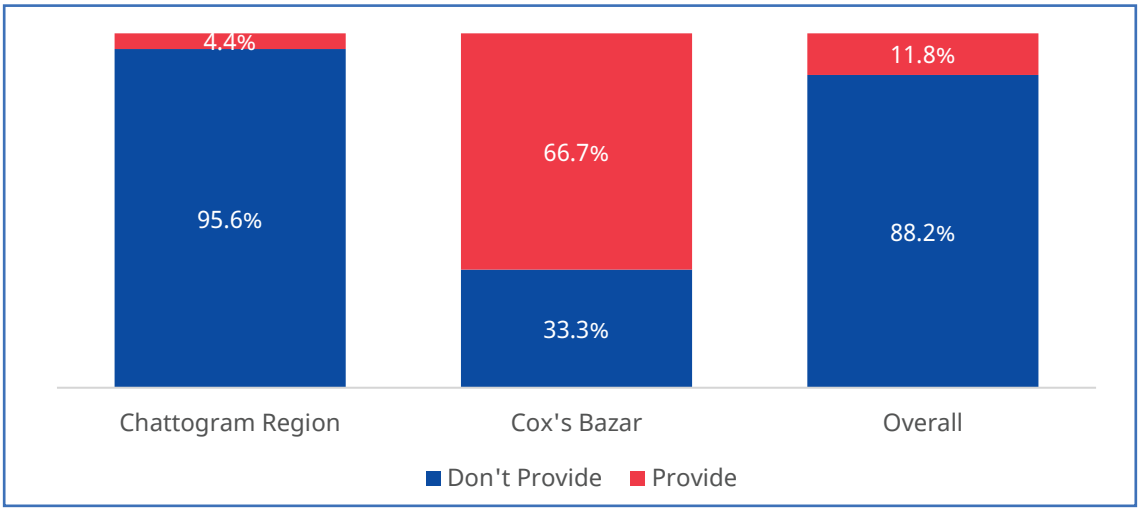


Source: Survey of TVET providers.

4.9.16. Status of work-based learning, including apprenticeships

Formal apprenticeships are crucial in technical and vocational education, but the study team did not find any formal apprenticeship arrangements for transport-related courses. That said, 12 per cent of the TVET providers stated that they try to arrange informal apprenticeship opportunities for their transport course trainees. This practice of arranging for informal apprenticeships is much more prevalent in Cox's Bazar, where it was reported by two-thirds of providers (67 per cent) try to secure trainees at least a short-term informal apprenticeship. In the Chattogram region, however, the practice is quite uncommon, being report by just 4.4 per cent of TVET providers. The overall ratio of males and females participating in transport apprenticeships is around 70 per cent male and 30 per cent female. But in Chattogram region, only 11 per cent of the apprenticeship participants were female, whereas in Cox's Bazar it was 38 per cent.

▶ Figure 97. Availability of apprenticeship opportunities linked to transport-related TVET programmes (%)



Source: Survey of TVET providers.

4.9.17. Internal factors affecting the sustainability of TVET providers

There are some internal factors that affect the sustainability of TVET providers. In assessing TVET providers in the Chattogram–Cox's Bazar region that offer transport-related courses, the study team observed that polytechnic institutes have a long-term plan, an operational plan for employees, a separate HR policy and department, a separate accounts department, and perform internal and external audits – making them the only institutions to have all of the indicators enquired about in the survey. Apart from having an HR policy and department, TSCs reported having all other internal factors. On the other hand, while not-for-profit providers all reported having separate accounts and HR departments and performing internal and external audits, half of them do not have long-term plans, do not have operation plans for employees, and lack the HR policies. And as can be seen in table 20, for-profit providers lag behind other types of providers, presenting a much more mixed record with regard to the internal factors they do or do not possess.

▶ **Table 21. Presence of internal factors affecting the sustainability of TVET providers offering transport-related courses**

Internal factors	For-profit TVET providers	Not-for-profit TVET providers (NGOs)	Polytechnic Institutes	TSCs
Have strategic plan/ long-term plan	50%	50%	100%	100%
Have annual work/ operational plan for employees	75%	50%	100%	100%
Have separate HR department	50%	100%	100%	0%
Have HR policy	75%	50%	100%	0%
Have separate accounts department	75%	100%	100%	100%
Perform internal financial audit	50%	100%	100%	100%
Audited by an external auditor	25%	100%	100%	100%

TSCs = Technical schools and colleges. Source: Survey of TVET providers.

4.9.18. Future plans and sustainability mechanisms of TVET providers

The future and sustainability of TVET providers offering transport-related courses depend on a diverse array of issues:

- Based on the qualitative findings, the study team found that TVET providers aspire to expand their RPL offerings in various trades within the transport sector, with the aim of certifying a significant number of students.
- TVET providers need financial support from both the Government and NGOs to allow them to enhance their capacities and make more substantial contributions to the transport sector's development and long-term growth.
- The research team noted that to ensure the sustainability of donor-funded TVET providers in the Chattogram–Cox's Bazar region, a viable approach could involve the implementation of fee-based enrollment systems.
- Establishing formal linkages with industries, particularly in the transport sector, could enhance sustainability by enabling TVET providers to tailor their training programmes to meet industry demand and qualification standards.
- Looking ahead also involves shifting away from traditional methods of service delivery in TVET providers. Providers are encouraged to embrace digital processes, including online registration, and adopt international benchmarks for training, focusing on upskilling trainees for overseas employment, which can contribute to increased remittances.

▶ 4.10. Sector-specific key supply side systemic constraints and challenges

The study team also found some sector-specific systemic supply side constraints for the transport sector, as follows.

4.10.1. Relevance of curricula and qualifications

The curricula for transport courses are generally not up-to-date and therefore do not meet the needs and demands of industry. FGD insights indicate that the curricula need to be more oriented towards meeting industry needs and thereby enabling more market-focused skills supply. Trainees and trainers also put stress on training concerning electric vehicles and engines, as they think electric vehicles are the future. By analysing the syllabuses of transport-related courses, it was observed that electric vehicles are only covered in diploma level courses. But even in these courses, the coverage of electric vehicles is only introductory, without any comprehensive knowledge provided.

Moreover, delivery and courier industries are now booming due to the exceptional growth of related e-commerce businesses. However, transportation-related courses are missing specific content related to these subsectors.

There was also mention during a KII that the current curricula are not fit for persons with disabilities, especially for NTVQF and 360-hour courses. This also poses a challenge related to the inclusivity of the course curricula, while also signaling the degree to which they are not up to date.

4.10.2. Delivery and assessment practices

In delivering courses – both formal and informal – instructors need to be oriented towards modern methods of teaching and orienting students. In a discussion with the principal of a TVET provider, the study team found that trainers need to update their knowledge and training approaches continuously in regard to new transport-specific skills demands, delivery methods and assessments.

There is also a need for more female instructors to promote inclusiveness. Some FGD participants mentioned the lack of female trainers as one of societal barriers hindering female students from enrolling in transport courses.

Concerning assessment practices, formal courses have definite assessment methods prescribed by the BTEB, but informal courses sometimes do not follow any standard assessment mechanism. As a result, the true potential of a graduate cannot be fully understood.

4.10.3. TVET providers' linkages and support for work-based learning

The industry–TVET provider linkage for transport sector is yet to be formalized. Based on the provider survey, there is evidence of informal linkages between the transport industry and TVET providers. TVET providers try to refer their trainees to industry through informal networks, and while polytechnics and some large NGO-operated TVET providers have placement cells, they generally do not function efficiently and there are no placement cells geared towards finding graduates work in specific sectors.

▶ 4.11. Skills gap analysis

From the ESS, major occupations for the transport sector were identified, and on the other side of the equation, the skills supply assessment identified the range of TVET providers offering transport-related skills development programmes. This information was later validated by sector experts and government regulatory officials during KIIs, enabling the construction the training gap analysis table below. Table 21 shows major occupations in the transport sector, the relevant skills training required, and the degree to which this training is available. Availability frequency was derived from the frequency with which a specific course/training was reported by TVET providers and how related that skill training is to each specific occupation.

▶Table 22. Training gap analysis for priority occupations in the transport sector

Major occupations	Skills training needed from TVET providers	Availability frequency	Remarks
Body/Coach Building Technician	▶ Iron sheet cutting and welding	Not available	
Driver	▶ Manual transmission driving, ▶ Automatic transmission driving, ▶ Motorbike driving and maintenance	Adequately available	
Motor Mechanic	▶ Motor problem diagnosis and repair	Adequately available	
Diesel Engine Mechanic	▶ Engine coil binding, ▶ Engine repair	Adequately available	
Heating and Ventilation Technician	▶ Repairing air conditioning systems, ▶ Engine heating and cooling system repair	Not available	
Automobile Electrician	▶ Electric vehicle servicing		Most of the related skills training are available in Chattogram region
Repair Service Technician	▶ Software-based diagnosis, ▶ Motorbike servicing		Most of the related skills training are available in Chattogram region
Mechanical Fitter	▶ Spare parts fitting	Not available	
Auto AC Technician	▶ Air conditioning repair and servicing		
Machinist	▶ Lathe works; ▶ CNC operations		

Body Building Technician was found to be one of the most in demand occupations in the transport sector, but there are no skills training programmes available for this occupation in surveyed providers in the Chattogram–Cox's Bazar region. Conversely, for Drivers many formal and informal training opportunities are available. For some major occupations, skills training programmes are available only in the Chattogram region.

▶ 4.12. Recommendations

The STED Workshop served as a forum for stakeholders to not only validate the outcomes of the surveys, FGDs, and KIIs, but also to contribute additional perspectives. The workshop facilitated the development of collective comprehension regarding skills needs and challenges in the transport sector. Moreover, this collaborative platform enabled stakeholders to generate recommendations aimed at addressing the identified and prioritized skills needs and challenges, fostering a pathway for future growth and success in the sector:

Specific occupational skills

- More Automobile Electricians – a hard-to-fill occupation – need to be produced as the sector grows, and Motorcycle Mechanics' skills need to be developed as the number of motorbike users are increasing. A particular focus should be placed on teaching knowledge and skills related to vehicle electrical systems, including wiring diagrams, alternators, starters and electronic control units.
- Body Building Technician is an in-demand occupation, and there is a need to offer proper skill development facilities for understanding vehicle bodywork, including frameworks, panels and structural components.
- Career prospects and related opportunities in the transport sector should be communicated to the young generation so that they can be aware of the potential pathways in the sector.
- Integrate training programmes focusing on the latest software-based problem diagnosis tools and technologies to enhance the ability of technicians to identify and troubleshoot complex issues in modern vehicles.
- Develop comprehensive courses on automotive electronics and computer systems to equip technicians with the skills needed for repairing and maintaining technologically advanced vehicles, such as electric vehicles, energy-efficient vehicles and hybrid vehicles.
- Emphasize training on safety protocols and compliance standards in the automotive industry, ensuring that technicians are well-versed in the latest safety measures and regulatory requirements.
- Training should cover essential driving skills, including road safety, traffic rules, vehicle control, navigation, and emergency handling.

Core work skills

- The core work skills in the transport sector include driving, technical skills concerning automobiles, knowledge of vehicle mechanics, and welding and metalworking skills. However, the number and frequency of formal courses for the acquisition of these skills are not adequate. Government agencies can work to persuade employers to recognize the importance of formal certification, which would also help to create incentives for more transport-related skills development programmes to be on offer.

- Equip technicians with strong communication and customer service skills. Strong communication skills can ensure their ability to effectively interact with clients, articulate technical issues in a clear manner, and build trust, contributing to positive customer experiences.

Collaboration between employers and training providers

- Given the transport sector's inclination towards on-the-job training, formalize experiential learning approaches to ensure comprehensive skills development. Create structured apprenticeships and internships that blend practical experience with theoretical knowledge.
- Establish apprenticeship programmes in conjunction with automotive repair and maintenance businesses. These programmes offer students valuable hands-on experience, allowing them to apply theoretical knowledge in a real-world setting. Additionally, apprenticeships contribute to building connections between students and industry professionals, enhancing their understanding of the sector.
- Invite industry professionals to conduct guest lectures and workshops within the TVET providers. This exposure provides students with insights into the latest trends, technologies and best practices in the automotive repair and maintenance sector. It offers a bridge between academic theory and practical industry application.
- Transport ISCs should be actively working at the regional level to ensure collaboration between regional employers and TVET providers.

Access to skills development, social inclusivity and lifelong learning

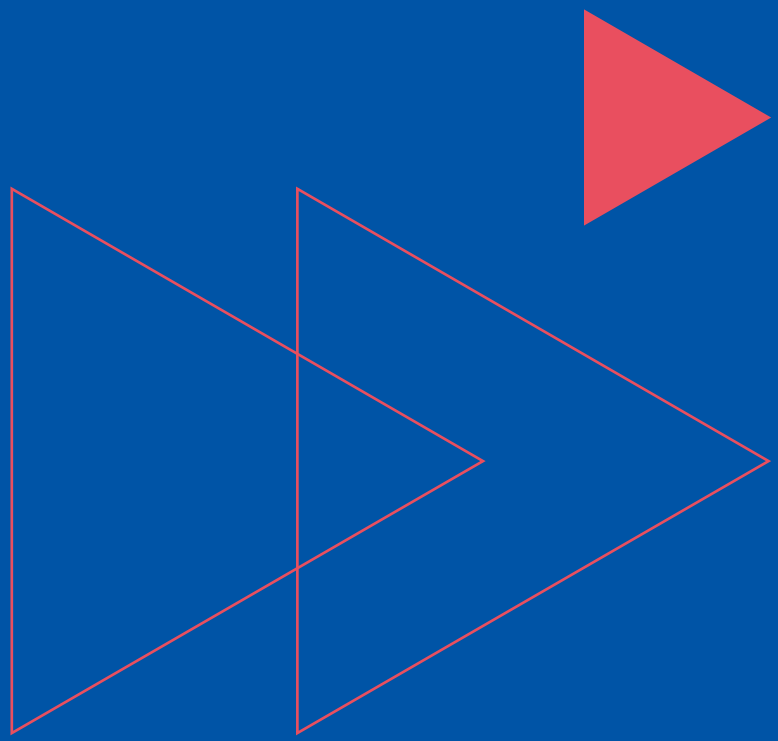
- Set up a structured framework for continuing professional development to enable technicians to engage in ongoing learning throughout their careers. This framework ensures that automotive technicians stay abreast of the latest industry trends, technological advancements, and best practices, contributing to their professional growth and adaptability.
- Build the capacity of training providers offering transport-related courses to make RPL available in order to formally acknowledge the skills and experiences of individuals who have acquired expertise through non-formal channels. This will allow them to participate in formal skill development programmes, recognizing and valuing the diverse pathways individuals may take to acquire relevant skills.

Wider systemic changes

- Conduct regular reviews of the curriculum to keep it aligned with the dynamic needs of the automotive industry. This involves identifying emerging trends, technological advancements, and skill requirements, and subsequently adapting the curriculum to ensure that students receive up-to-date and relevant training.
- Work towards incorporating recognized industry certifications into TVET programmes. This integration enhances the value of the training by providing students with qualifications that are widely acknowledged by employers in the automotive sector, increasing the employability of graduates.
- Advocate with driving schools and repair/maintenance training institutes to upgrade their technological infrastructure to create modern and well-equipped training facilities. This includes providing access to state-of-the-art tools, equipment and technologies that align with industry standards. Upgrading infrastructure ensures that students receive hands-on training using the latest tools and methodologies employed in the automotive industry.

5

Manufacturing sector



Chapter 5. Manufacturing sector

▶ 5.1. Introduction

The manufacturing sector is one of the key drivers of the Bangladesh economy, as it contributes to the GDP, exports, employment and industrialization. The manufacturing sector consists of various subsectors, such as textiles and garments, light engineering, furniture, pharmaceuticals, food and beverages, ceramics, shipbuilding, electronics, and so on. According to a report by the ADB, the manufacturing sector accounted for about 18 per cent of GDP, 85 per cent of exports, and 20 per cent of employment in 2019 (Titumir 2021). In recent years, the sector has demonstrated significant growth in its contribution to GDP, as reported in the Bangladesh Economic Review 2023. Specifically, the GDP growth rates for the sector were as follows: 12.33 per cent in 2018–19, 1.68 per cent in 2019–20, 11.59 per cent in 2020–21, 11.41 per cent in 2021–22, and 9.23 per cent in 2022–23. Alongside this growth, the sector's contribution to the national GDP has been notably strong, registering at 22.86 per cent in 2018-19, 22.24 per cent in 2019-20, 23.36 per cent in 2020-21, 24.29 per cent in 2021-22, and reaching 24.95 per cent in 2022-23 (Bangladesh, Ministry of Finance 2023). Being the prime hub of the county's external trade, the Chattogram region plays a significant role in the manufacturing sector. Being the tourism capital of Bangladesh, Cox's Bazar is also a potential site for manufacturing industries, such as food and beverages, salt, fish, and handicrafts. Despite having such potential, the manufacturing sector of the Chattogram–Cox's Bazar region suffers from low productivity and competitiveness due to the lack of innovation, technology and skilled workers (World Bank 2021).

▶ 5.2. Profile and situation analysis for the manufacturing sector

5.2.1. Economic profile

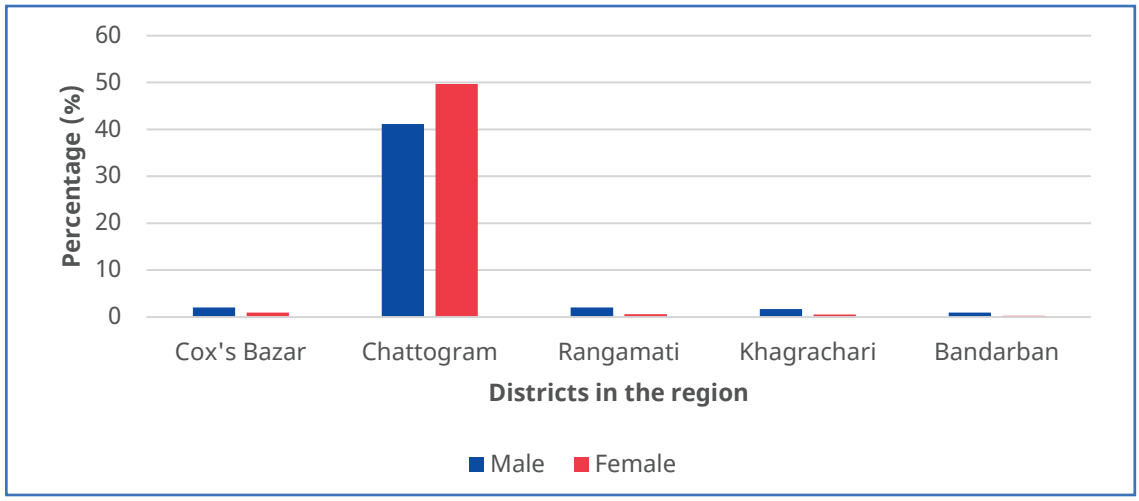
According to Bangladesh Bureau of Statistics data, there were some 380,000 industrial units in the Chattogram–Cox's Bazar region engaging about 1.97 million persons in industrial activities in 2013 (BBS 2016, as cited in Hossain and Nazem 2016). These numbers have certainly increased a great deal over the following decade, considering that the local manufacturing sector accounted for 35 per cent of GDP in the region in 1999–2000 (BBS 2005, as cited in Hossain and Nazem 2016). The manufacturing sector in the Chattogram–Cox's Bazar region includes large-scale, medium-scale and small-scale manufacturing activities, as well as handicrafts and cottage industries. The Chattogram–Cox's Bazar region accounts for 40 per cent of Bangladesh's industrial output, and the composition of the sector includes readymade garments, food processing, textiles, non-metallic mineral products and basic metals industries. The region has also dominated the manufacturing sector at the national level, as it was home to 80.73 per cent of macro manufacturing establishments and 89.80 per cent of manufacturing employment in 2009 (BBS 2010a, as cited in Hossain and Nazem 2016).

5.2.2. Workforce profile

In the Chattogram–Cox's Bazar region the manufacturing sector is one of the main drivers of economic growth and development, contributing to GDP, employment, exports and innovation (ADB, n.d.-d;

UN and World Bank 2020). The manufacturing sector employs around 1,051,625 people in the region, according to the 2022 Labour Force Survey (LFS). Employment is expected to increase further as the Government of Bangladesh has established multiple economic zones in the region – namely the Cox's Bazar and Moheshkhali economic zone-1, Cox's Bazar and Moheshkhali economic zone-2, and the Kalarmarchara economic zone (Bangladesh, BEZA, n.d.). The impact of these economic zones has been already reflected in the statistics, with a comparison between the LFS 2016–17 and LFS 2022 showing a roughly 14 per cent increase in manufacturing employment in the region, including a 25 per cent increase in female employees. As Chattogram is a major industrial hub, the manufacturing sector accounts for quite a large share of employment in the region – 41.1 per cent of male employees and 49.7 per cent of female employees.

▶ Figure 98. Share of all workers in the Chattogram–Cox's Bazar region working in the manufacturing sector, by district and sex (%)



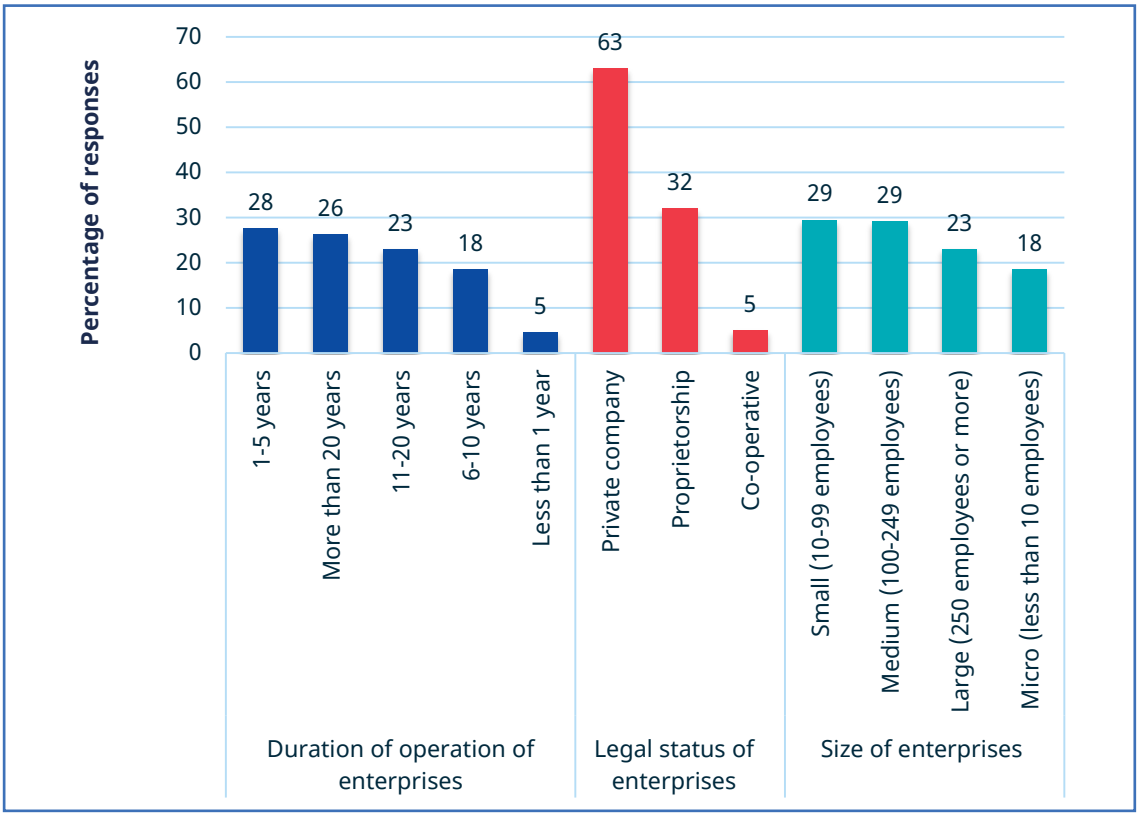
Source: 2022 Labour Force Survey.

5.2.3. Business profile

As per the Bangladesh Economic Census 2013, a total of 88,955 manufacturing establishments are operating in the five target districts of the Chattogram–Cox's Bazar region. Of these, 66 per cent are in Chattogram district, 15 per cent are in Cox's Bazar, 9 per cent are in Rangamati, 7 per cent are in Khagrachari and 3 per cent are in Bandarban (Bangladesh, BBS 2013b).

Figure 101 illustrates the profiles of surveyed manufacturing enterprises based on their size, length of business operation, and legal status. Regarding the size of surveyed enterprises, the data indicates a significant lean towards small enterprises, with 30 per cent of the surveyed companies having between 10 and 99 employees. Medium-sized enterprises, which employ 100–249 individuals, are almost as common, making up 29 per cent of the total. In terms of business longevity, 28 per cent of enterprises have been operational for 1–5 years, with an additional 26 per cent having been around for 6–10 years. Companies that have been operational for 11–20 years represent 23 per cent, indicating a stable core of experienced businesses within the sector. Interestingly, businesses that have been operating for more than 20 years constitute only 18 per cent, which might suggest either a lower rate of long-term survival or a relatively recent increase in new enterprise formation. Finally, the legal status of enterprises shows a dominance of private companies, which make up 63 per cent of the surveyed entities. This points to a strong preference for or prevailing trend towards private ownership structures within the manufacturing sector. Sole proprietorships make up 32 per cent, indicating a significant portion of companies are owned and run by individuals.

▶ Figure 99. Overview of surveyed manufacturing sector enterprises: Length of business operations, legal status and size of enterprise (% of respondents, N=217)

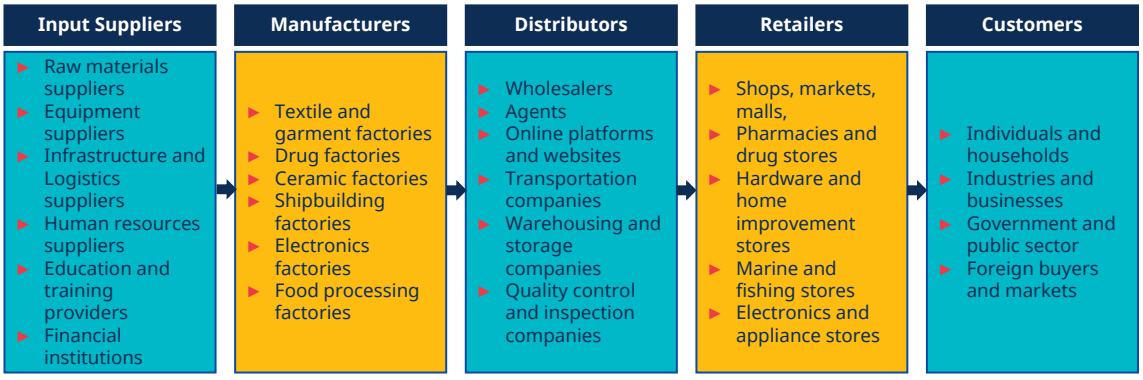


Source: ESS 2023.

5.2.4. Value chain analysis

Based on the secondary review, this study mapped an overall generic value chain for the manufacturing sector, which includes various components such as input suppliers, manufacturers, distributors, retailers and consumers. Each of these components are described below:

▶Figure 100. Value chain for the manufacturing sector



Source: United States, USAID and Winrock International; Rayhan et al. 2021

Input suppliers

These are entities that provide the necessary inputs for the manufacturing sector, such as raw materials, equipment, infrastructure, human resources and so on. Some examples of input suppliers in Bangladesh are:

- Agricultural producers and processors that supply leather, cotton, jute, and other natural fibers to the textile and garment industry.
- Chemical and pharmaceutical companies that supply active ingredients, excipients and packaging materials to the drug industry.
- Metal and engineering companies that supply steel, iron, aluminum and other metals and components to the shipbuilding and electronics industry.
- Education and training institutions that offer courses and programmes for manufacturing professionals and workers.
- Financial institutions that provide loans and credit to manufacturing businesses and investors.

Manufacturers

These are the entities that directly produce goods from inputs using machinery, labour and technology. They add value to the inputs by transforming them into finished or semi-finished products. Some examples of manufacturers in Bangladesh are:

- Textile and garment factories that produce fabrics, yarns, clothing and accessories for the domestic and export markets.
- Drug factories that produce generic and branded medicines, vaccines and medical devices for the domestic and export markets.
- Ceramic factories that produce tiles, sanitary ware, tableware and decorative items for the domestic and export markets.
- Shipbuilding factories that produce ships, boats and other vessels for the domestic and export markets.
- Electronics factories that produce electrical and electronic appliances, components and devices for the domestic and export markets.

Distributors

These are the entities that facilitate the connection between manufacturers and retailers, such as marketing, distribution, logistics, and so on. They add value to the products by making them available and accessible to the retailers and customers. Some examples of distributors in Bangladesh are:

- Wholesalers and agents that buy products in bulk from manufacturers and sell them to retailers or customers.
- Online platforms and websites that promote and advertise manufacturing products to retailers or customers.
- Transportation companies that deliver products from manufacturers to retailers or customers by road, rail, water or air.
- Warehousing and storage companies that store products from manufacturers until they are sold to retailers or customers.
- Quality control and inspection companies that ensure the quality and safety of products from manufacturers before they are sold to retailers or customers.

Retailers

These are the entities that sell products to the final customers, such as shops, markets, malls and so on. They add value to the products by providing convenience, variety and service to customers. Some examples of retailers in Bangladesh are:

- Shops and markets that sell textile and garment products, such as clothing, accessories, fabrics and so on. Pharmacies and drug stores that sell drug products, such as medicines, vaccines, medical devices and so on. Hardware and home improvement stores that sell ceramic products, such as tiles, sanitary ware, tableware and so on.
- Marine and fishing stores that sell shipbuilding products, such as ships, boats and other vessels.
- Electronics and appliance stores that sell electronics products, such as electrical and electronic appliances, components and devices.

Customers

These are the final consumers of manufacturing products, who buy them for various purposes, such as personal, household, industrial, commercial and so on. Customers derive value from the products by using them to satisfy their needs and wants. Some examples of customers in Bangladesh are:

- Individuals and households who buy textile and garment products, drug products, ceramic products, electronics products and so on for personal or household use.
- Industries and businesses that buy textile and garment products, drug products, ceramic products, shipbuilding products, electronics products and so on for industrial or commercial use.
- Government and public sector entities that buy textile and garment products, drug products, ceramic products, shipbuilding products, electronics products and so on for public or social use.
- Foreign buyers and markets that buy textile and garment products, drug products, ceramic products, shipbuilding products, electronics products and so on for export or trade.

Figure 102 above is a simplified version of the generic sector value chain for the manufacturing sector in Bangladesh. In reality, there may be more actors and activities involved in each stage of the value chain. Moreover, the value chain is not static, but dynamic. It changes over time due to various factors, such as market demand, technological innovation, competitive pressure, environmental impact, social norms and policy interventions[12]. Therefore, it is important to reassess the generic sector value chain for manufacturing sector in Bangladesh periodically to identify its strengths, weaknesses, opportunities and threats, and to devise strategies for enhancing its performance and sustainability (India, Pharmexcil 2020).

5.2.5. Institutional mapping for the manufacturing sector

Institutional mapping of the manufacturing sector in the Chattogram–Cox's Bazar region of Bangladesh highlights the crucial roles played by a variety of organizations, each contributing significantly to the sector's growth and development. This section presents a brief overview of the major players in the manufacturing sector. A more comprehensive outline of these actors can be found in the institutional mapping in annex table 6.

12 See: Titumir 2021; AQF 2021; World Bank, n.d.; and Bangladesh, BIDA, n.d.-a.

Ministry of Industries

As the primary government body, the Ministry of Industries is pivotal in formulating policies and strategies that promote, expand and ensure the sustainable development of the manufacturing sector. It sets the regulatory framework and oversees the implementation of industry-related policies.

Bangladesh Chemical Industries Corporation (BCIC)

The BCIC plays a vital role in managing the production and marketing of key chemical products and fertilizers. Its operations support the agricultural sector, which is crucial for manufacturing-related goods, thereby creating a foundational base for various manufacturing processes.

Bangladesh Small and Cottage Industry Corporation (BSCIC)

The BSCIC offers a wide range of services to small and cottage industries, including infrastructure facilities, credit, training, consultancy and marketing assistance. Its support is integral to the growth and development of these smaller-scale industries within the broader manufacturing sector.

Bangladesh Standards and Testing Institution (BSTI)

The BSTI is key in developing and maintaining product and service standards. It conducts essential testing, certification, inspection and calibration, ensuring the quality and safety of various products such as food, drugs, textiles and electronics.

Bangladesh Institute of Management (BIM)

The BIM specializes in offering management training and development programmes. These programmes are tailored to enhance the efficiency and skills of managers within the manufacturing sector, thereby contributing to improved operational productivity.

Department of Patents, Designs and Trademarks (DPDT)

The DPDT plays a crucial role in protecting intellectual property in the manufacturing sector. By overseeing the registration and protection of patents, designs and trademarks, it ensures that innovations and creative designs in manufacturing are legally safeguarded.

Bangladesh Investment Development Authority (BIDA)

BIDA is instrumental in promoting and facilitating both domestic and foreign investment in Bangladesh. It provides various services to investors, including one-stop service, information and guidance, and policy advocacy, which are essential for stimulating growth and development in the manufacturing sector.

Bangladesh Export Processing Zones Authority (BEPZA)

BEPZA provides incentives and facilities to investors and exporters in export processing zones (EPZs), such as tax holidays and duty-free imports. This support is vital for enhancing the sector's export potential and global competitiveness.

Industry and trade associations

Various industry and trade associations, such as the BGMEA, BAPI and BEEMA, play a significant role in supporting and promoting business establishments. They assist in market development, skills development, product promotion and technology adoption, acting as crucial intermediaries between the Government and manufacturing businesses.

Bangladesh University of Engineering and Technology (BUET) and Technical Training Centers

These educational institutions provide critical training and research in engineering, architecture and vocational skills. Their role in developing a skilled workforce is indispensable for the sustained growth and technological advancement of the manufacturing sector.

5.2.6. Analysis of business environment: SWOT

The SWOT analysis below is derived from FGDs and KIIs conducted in the Chattogram–Cox's Bazar region, and provides insight into the manufacturing sector's current state and future prospects. Additional resources for the SWOT matrix were derived from the secondary review[13].

- **Strengths**
  The manufacturing sector in Chattogram shows a number of significant strengths. A key aspect is the availability of plentiful and cost-effective human resources in the region. Strengths also include: the region being strategical located near the Port of Chattogram and the Port of Matarbari; having a favourable business environment due to the presence of special economic zones (SEZs) and export processing zones (EPZs); and strong domestic and international demand for its products. Having a well-established textile and garment industry in the region strengthens the region even more, and the region also has the potential to develop other manufacturing industries, such as shipbuilding, pharmaceuticals, and leather and footwear, which have shown significant growth and competitiveness in recent years.

- **Weaknesses**
  The manufacturing sector in region also faces several challenges and constraints, such as low productivity and quality, inadequate infrastructure and utilities, lack of skilled and trained workers, high dependency on imported raw materials and intermediate goods, low value addition and innovation, and poor compliance with labour and environmental standards. The region also suffers from political instability, social unrest, corruption and bureaucratic hurdles, which hamper business confidence and the investment climate.

- **Opportunities**
  The region has several opportunities for enhancing the skill development and employment creation in the manufacturing sector, such as leveraging regional and global market access and integration, especially with South Asian and South-East Asian countries, diversifying the export basket and markets, upgrading the technology and skills, promoting backward and forward linkages, fostering entrepreneurship and innovation, and attracting foreign direct investment and joint ventures. The region also has an opportunity to benefit from the ongoing and upcoming infrastructure projects, such as the SASEC Chattogram–Cox's Bazar Railway Project, the Chattogram–Cox's Bazar Highway Improvement Project, and the Matarbari Port Development Project, which will improve transport and logistics connectivity and efficiency in the region.

- **Threats**
  The region faces several threats and risks that may affect skills needs and occupations in the manufacturing sector, such as:
    - competition and pressure from other low-cost producers, especially in the textile and garment industry;
    - volatility and uncertainty in the global market and trade environment, especially due to the COVID-19 pandemic and trade tensions between major economies;
    - the environmental and social impacts of manufacturing activities, especially on natural resources, biodiversity and the livelihoods of local communities, and
    - security and safety issues, especially due to natural disasters, terrorism and violence.

13 See: University of Kansas, CCHD, n.d.; Saylor Academy, n.d.; Joliet Junior College 2015; WIPO, n.d.

5.2.7. Key drivers of change in the manufacturing sector

The key drivers of change in the manufacturing sector in the Chattogram–Cox's Bazar region, as suggested by the thematic responses from FGDs and KIIs, can be outlined as follows:

Technological advancements

The advent of the Fourth Industrial Revolution has introduced robotics, AI, and machine-centric production processes, which necessitates a shift towards a more skilled workforce capable of managing and working alongside advanced machinery.

Government policy and support

The degree of government involvement, particularly in skills development projects and modern technology training, is a critical driver. The potential for leveraging institutional training and ensuring education as effective measures for the production sector points to government policy as a catalyst for change.

Education and training

The current gaps in practical knowledge within educational institutions indicate a drive towards reforming training and education to meet industry demands. Initiatives such as bringing in street children to Technical Training Centers and corporate training programmes reflect a movement towards bridging these gaps.

Inclusivity in employment

The promotion of inclusive employment, especially the employment of women and disabled individuals, is a social driver that is changing the face of the workforce in the region.

Market and economic pressures

The COVID-19 pandemic has shown that external market pressures can significantly affect the sector, driving changes in production levels and influencing the psychological well-being of workers, which in turn impacts productivity and skill application.

Corporate practices

Individual company initiatives, such as those by Well Food and Beverages, show a trend towards companies taking more responsibility for the training and development of their workforce, indicating a shift towards more corporate-led change in skills and workforce management.

Socio-economic initiatives

Proposals to integrate marginalized groups into the workforce, such as training street children, not only offer social benefits but also contribute to the economic development of the region by expanding the labour pool.

Globalization and export duties

The manufacturing sector in the region is likely influenced by its role in the global supply chain, requiring the sector to adapt to international standards and practices to remain competitive.

▶ 5.3. Profile of major occupations

Through the ESS and secondary research the study was able to produce an extensive list of key occupations in the manufacturing section in the Chattogram–Cox's Bazar region. This list was reinforced by FGDs and KIIs, but unlike other sectors, there was no STED Workshop with manufacturing sector stakeholders for them to verify the list and suggest additions. While table 22 below provides only the major occupations in the manufacturing, annex table 11 provides a more detailed list, along with the skills needed for each occupation and the level of priority that each occupation holds in the sector (with the latter determined solely by the frequency with which an occupation was cited in the ESS).

▶Table 23. Major occupations in manufacturing sector

Management and supervisory roles	Operational and production roles
▶ Manager ▶ Supervisor ▶ Quality Controller ▶ Sales and Marketing Executives ▶ Stock/Storekeeper	▶ Machine Operator ▶ Packaging Operator ▶ Assembler ▶ Handicraft Maker (Bamboo and Cane)
Technical and engineering roles	**Support and auxiliary roles**
▶ Mechanical Technician ▶ Electrical Technician ▶ Industrial Engineer ▶ Marine Engineer	▶ Assistant/Helper ▶ Dispatcher/Loader ▶ Security Guard

Source: ESS 2023 and secondary documents.

Management and supervisory roles

Managers and Supervisors require a broad array of management skills including: leadership, motivation, organization, planning, understanding of business operations, problem solving, decision-making, familiarity with production processes, the ability to monitor and evaluate employee performance, and project management skills. These skills underscore the multifaceted nature of managerial responsibilities, which range from strategic oversight to day-to-day operational control.

Technical and engineering role

Technical roles such as Mechanical Technicians and Electrical Technicians are also in demand, highlighting the technical backbone of the manufacturing sector. These roles require technical knowledge and training in their specific fields, proficiency with industry-specific software and tools, strong analytical and problem-solving skills, and an understanding of engineering principles and mathematics.

Operational and production roles

There is high demand for Machine Operators, reflecting their position at the operational core of manufacturing. Skills necessary for this role include the ability to operate machinery and equipment, understanding of production procedures, maintenance skills for equipment, and quality inspection skills.

Support and auxiliary roles

Assistants and Helpers are essential for the smooth functioning of manufacturing operations. Good communication skills, organizational abilities, basic computer literacy, and physical fitness are key to performing these roles effectively.

Creative and design roles

Designers have a more niche – but essential – role within the sector. Skills required include artistic ability and creativity, proficiency with design software such as Adobe Creative Suite, and an understanding of design principles and trends. This role is critical in ensuring that the end products meet both functional and aesthetic standards.

Sales, marketing and finance roles

Cashiers and Accountants play a critical role in the commercial side of manufacturing. They need to understand market trends, have sales and negotiation skills, be numerate with money-handling abilities, and be proficient with financial software and record-keeping. These skills are crucial for the financial health and market competitiveness of manufacturing businesses.

Specialized technical roles

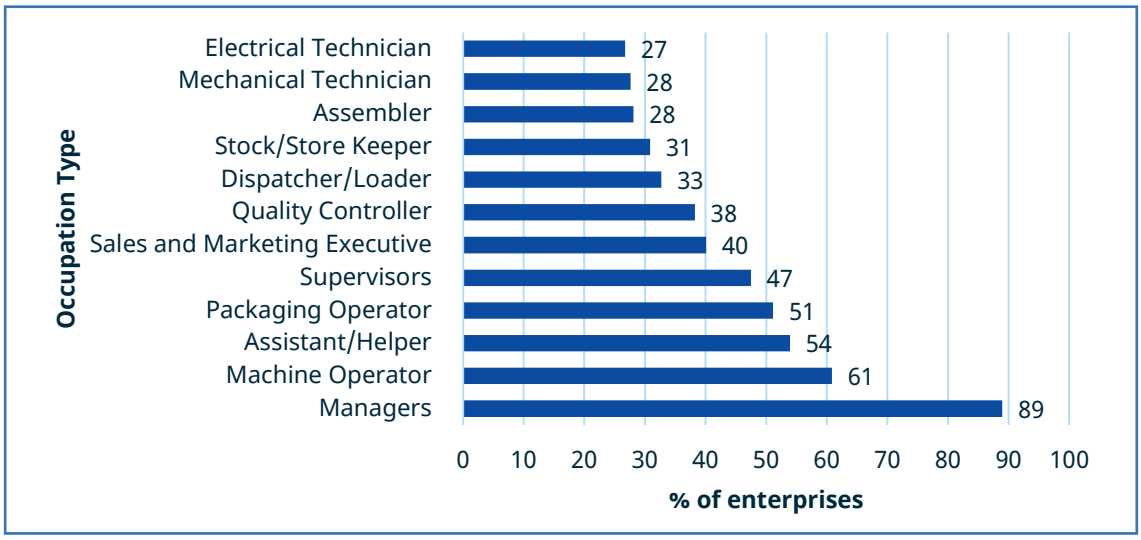
Specialized technical roles such as Electronics Mechanics and Welders require in-depth, field-specific technical knowledge, proficiency with tools and machinery, a detailed understanding of safety regulations, and the ability to read technical diagrams.

5.3.1. Major occupations and their required skills

The surveyed manufacturing enterprises were asked to identify the major occupations in the sector in the Chattogram–Cox's Bazar region. Managers were the most commonly cited occupation, being put forward by 89 per cent of surveyed enterprises, while Machine Operators were mentioned by 61 per cent, followed by Assistants/Helpers (54 per cent) (figure 103), Packaging Operators (51 per cent), Supervisors (47 per cent), Sales and Marketing Executives (40 per cent), and Quality Controllers (38 per cent). It should be noted that the manufacturing sector involves a large variety of businesses and production types, which can translate to a diverse array of occupations across the various subsectors.

According to the Survey of Manufacturing Industries 2019 by the Bangladesh Bureau of Statistics, 88 per cent of the occupations in the manufacturing sector are associated with production-related work, while the remaining occupations are across administrative, managerial, clerical and owner roles, among others.

▶ Figure 101. Major occupations in the manufacturing sector according to surveyed enterprises (% of respondents, N=217)

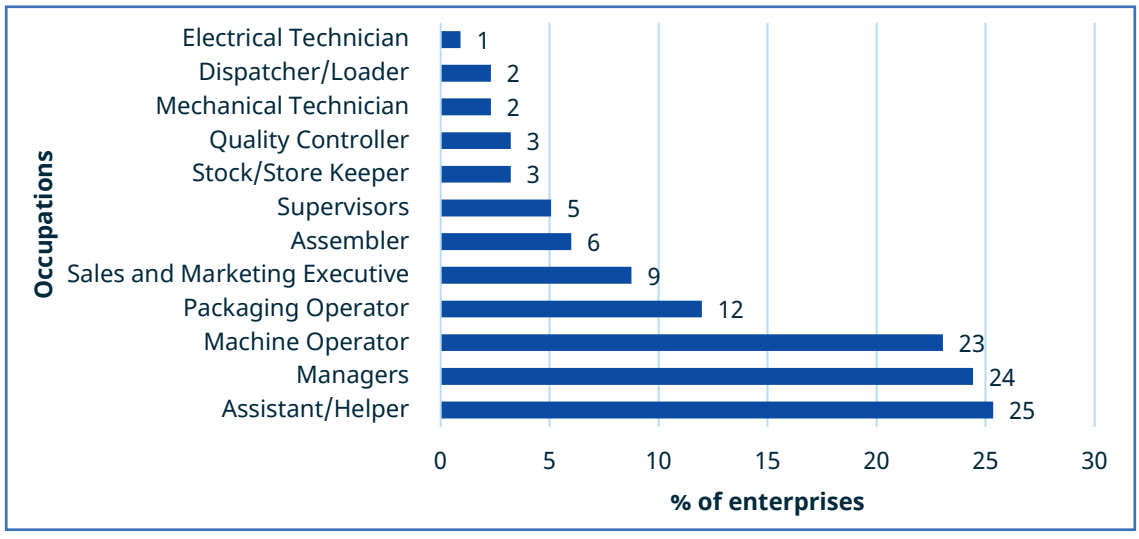


Note: Multiple responses possible. Source: ESS 2023.

5.3.2. Recruitment

In terms of job vacancies among the major occupations above, the most commonly provided response was Assistant/Helper positions, with 25 per cent of enterprises reporting vacancies for this role (Figure 104). This suggests that there is a high need for general support personnel in manufacturing, which may involve a variety of tasks from material handling to assisting skilled workers. Managers and Machine Operators are also in high demand with 24 per cent and 23 per cent of enterprises reporting vacancies, respectively, reinforcing the importance of individuals capable of managing and operating the machinery that is central to the manufacturing process. Packaging Operators came it with a relatively lower share of responses (12 per cent), but still indicating a general need for workers to handle the final stages of production, ensuring products are suitably packaged for distribution.

▶ Figure 102. Vacant positions in surveyed manufacturing enterprises (% of respondents, N=217)

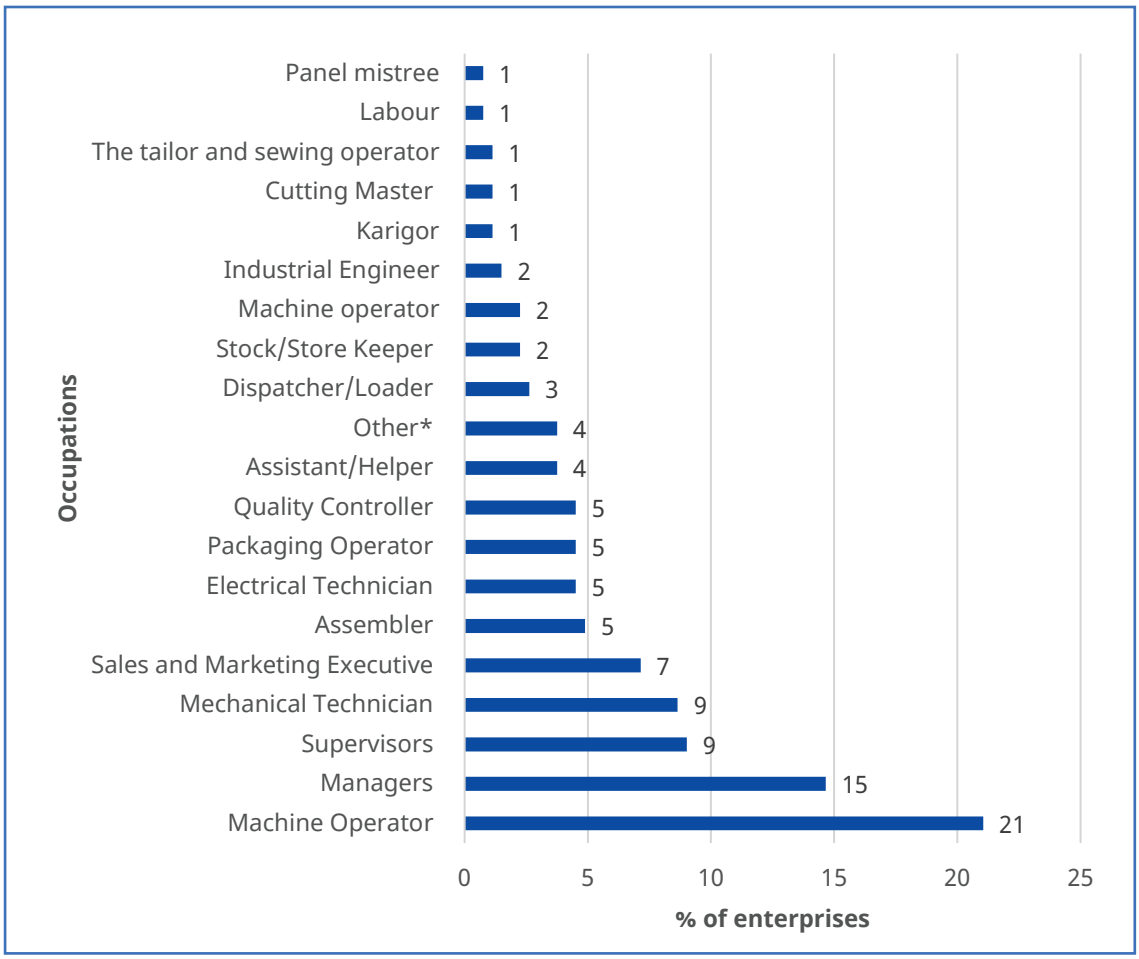


Note: Multiple responses possible. Source: ESS 2023.

5.3.3. Hard-to-fill occupations in the manufacturing sector

Figure 105 presents hard-to-fill occupations within the manufacturing sector. The data suggests that Machine Operator roles are the most challenging to fill, with 21 per cent of enterprises giving this response. This indicates a significant gap between the availability of skilled labour and the industry's needs for machine operation expertise, and this was reinforced by FGD and KII participants who noted that certified machine operators are very scarce in the market. Managers, Supervisors and Mechanical Technicians were cited by 15 per cent, 9 per cent and 9 per cent of enterprises, respectively. This is shows a considerable demand for leadership and management skills, reflecting possibly either a lack of qualified candidates or high turnover rates in these important roles. The difficulty in filling Mechanical Technician roles underscores the need for technical skills specific to the maintenance and repair of machinery, which are critical for maintaining productivity and minimizing downtime in manufacturing operations.

▶ **Figure 103. Hard-to-fill occupations in the manufacturing sector according to surveyed enterprises (% of respondents, N=217)**

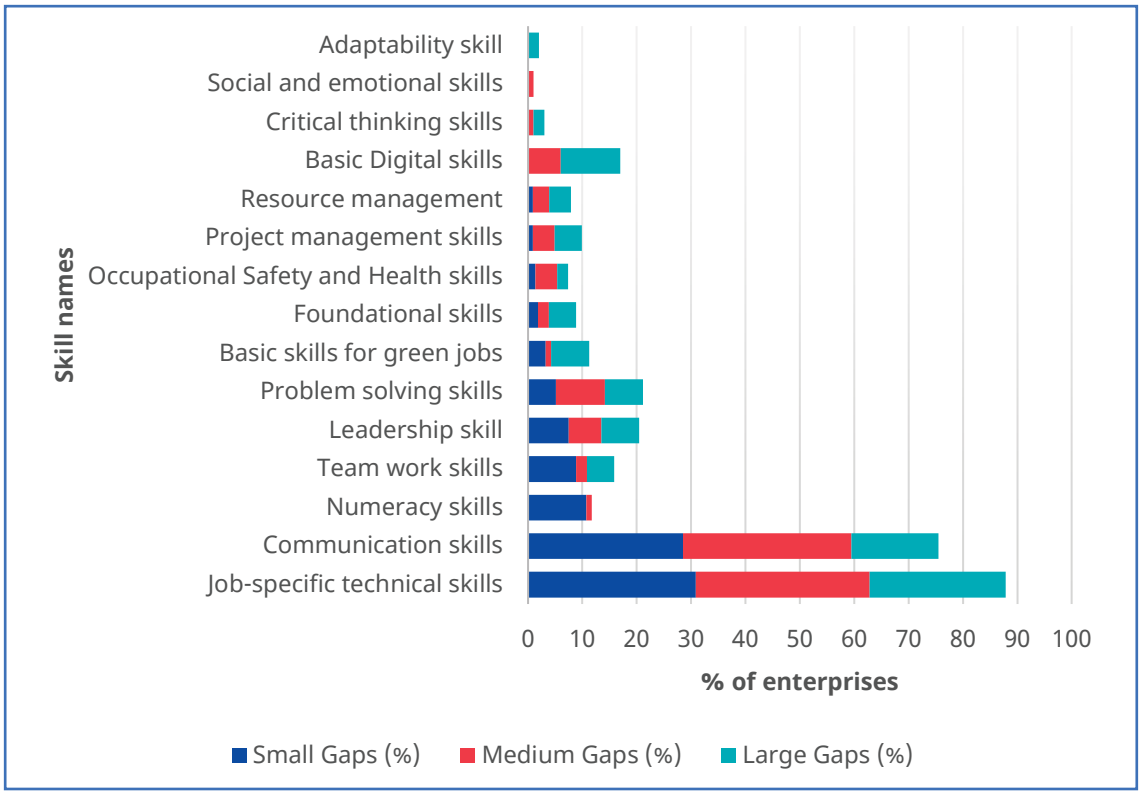


Note: Multiple responses possible. * Other comprises the following occupations: Automobile Electronics, Computer Officer, Filler, Folder, Goldsmith, Kormokar, Loader, Producing Operator, Accounts, and Security Guard. Source: ESS 2023.

▶ 5.4. Current workforce and skills

The surveyed enterprises were asked to identify skill gaps within the manufacturing sector, with their responses indicating that the largest gaps exist in job-specific technical skills, with a significant with a strong majority of enterprises (25 per cent) reporting gaps in this area, including 32 per cent reporting medium to large gaps (figure 106). Communication skills are vital for operational efficacy, but are apparently lacking across much of the sector with 76 per cent of enterprises citing gaps in this area, including 31 per cent stating that these gaps are medium and 16 per cent stating large gap. Roughly 20 per cent of enterprises also reported gaps in leadership skills and problem-solving capabilities, with the majority of these responses stating that these gaps are medium or large; as such, enterprises could likely benefit from enhanced training in these areas.

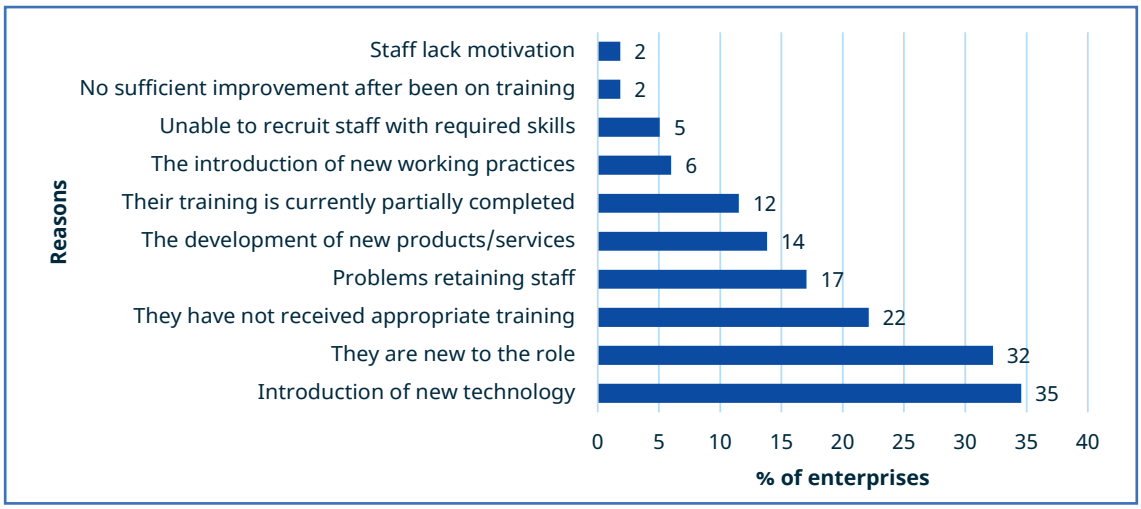
▶Figure 104. Skills gaps cited by manufacturing enterprises (% of respondents, N=217)



Note: Multiple responses possible. Source: ESS 2023.

Figure 107 provides an overview of enterprises responses concerning the causes of workers not being fully proficient in their roles. The leading cause, indicated by nearly 35 per cent of responses, is due to the introduction of new technology, suggesting that rapid technological change is outpacing worker training. This is followed by being new to the role (32 per cent) and not receiving appropriate training (22 per cent). These reasons point to gaps in both onboarding processes and ongoing training programmes. Additionally, problems in retaining staff (17 per cent) and the development of new products and services (14 per cent) are mentioned as causes for under-proficiency. Staff retention issues can lead to a loss of skilled labour and institutional knowledge; while the introduction of new products and services may require skills that the current workforce does not possess.

▶ Figure 105. Main causes of workers not being fully proficient, according to manufacturing enterprises (% of respondents, N=217)

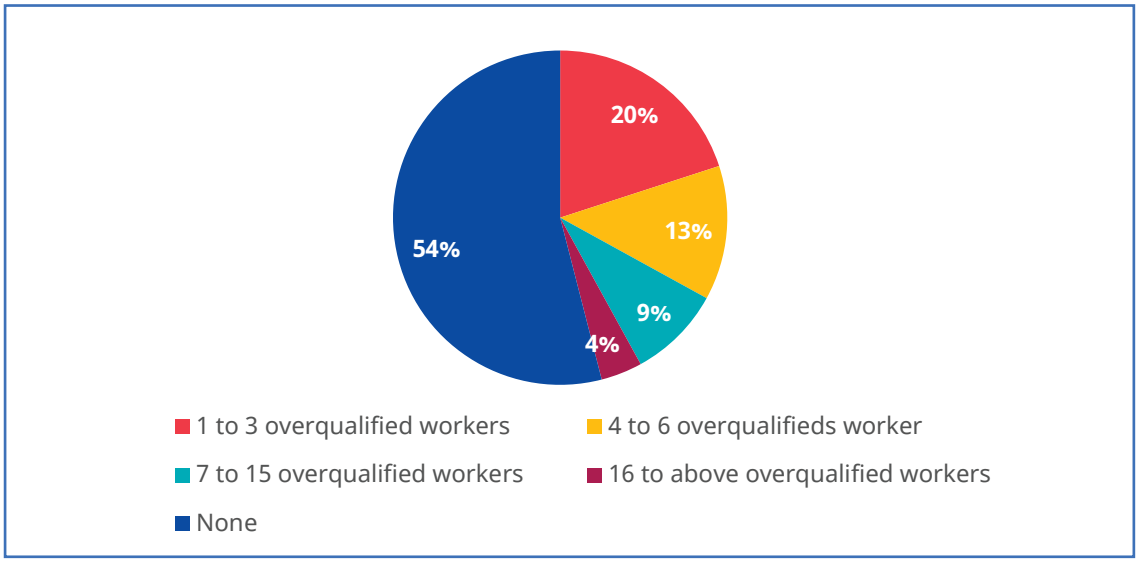


Note: Multiple responses possible. Source: ESS 2023.

5.4.1. Underutilization

Roughly 46 per cent of surveyed manufacturing enterprises reported that their workforce contains overqualified workers suggesting that a notable portion workers in the sector may possess qualifications that exceed the requirements of their current roles. This can imply that the potential of these employees may not be fully utilized within the company, and that a substantial number could potentially be better leveraged to take on more complex tasks or advanced roles. In all, 20 per cent of enterprises reported having just 1 to 3 overqualified workers; 12 per cent had 4 to 6 overqualified workers; 9 per cent had 7 to 15 overqualified workers, and nearly 4 per cent had 16 or more workers that should be in a more advanced role.

▶ Figure 106. Share of workers in surveyed enterprises with qualifications surpassing their job requirements (% of respondents, N=217)

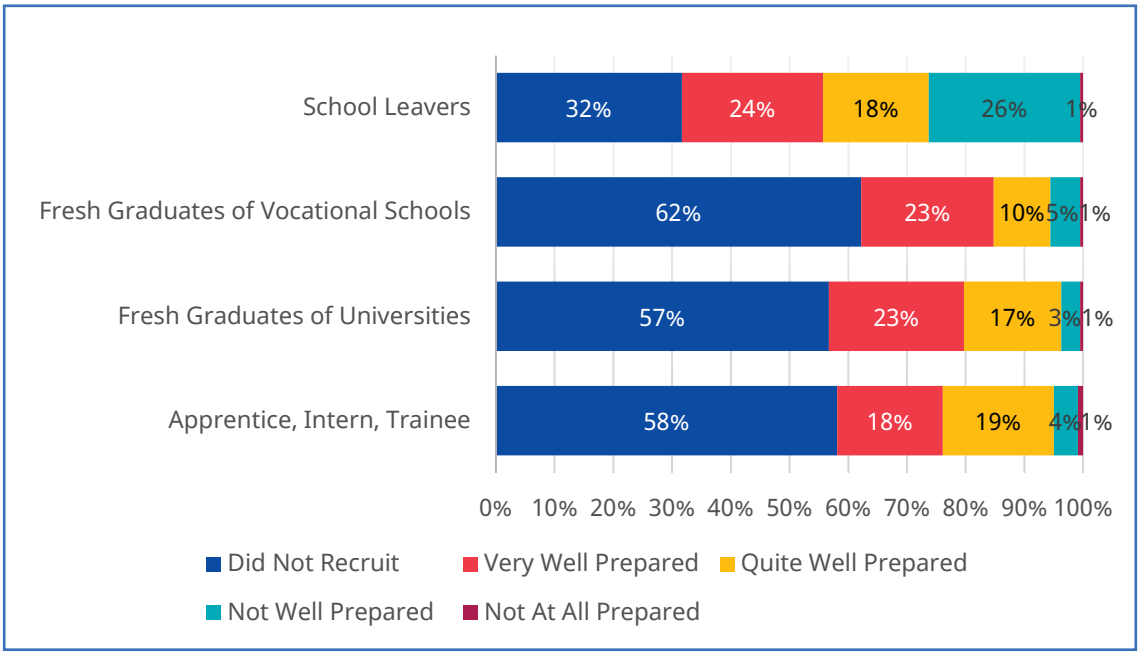


Source: ESS 2023.

5.4.2. New entrants

Figure 109 provides insights into the perceived readiness of new entrants into the manufacturing sector. Overall, manufacturing enterprises were more likely to recruit school leavers than jobseekers who are fresh TVET graduates, fresh university graduates or apprentices/trainees. Roughly two-thirds of respondents (68 per cent) reported that they have recruited school leavers; while only about 40 per cent reported hiring workers who had TVET/apprentice experience or a university education. However, the responses also clearly show that new recruits who are TVET grads, university grads or apprentices/trainees are much less likely to be unprepared for their job, as enterprises were much more likely to say that school leavers were "not well prepared". This result offers a potential means of encouraging greater hiring of TVET graduates among manufacturing enterprises, namely that those manufacturing enterprises that have hired TVET graduates generally find them to be better prepared than school leavers.

▶ Figure 107. Preparedness level of new entrants in their first jobs, type of new entrant (% of respondents, N=217)



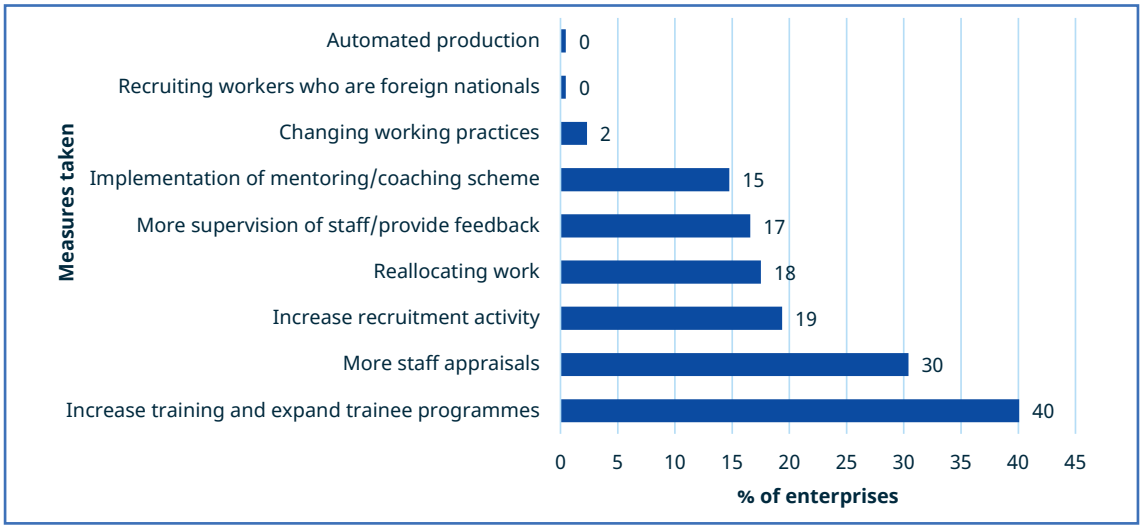
Source: ESS 2023.

▶ 5.5. Workforce development

Figure 110 illustrates various strategies that organizations have implemented to address workforce proficiency issues. The most prominent measure, indicated by 40 per cent of respondents, is to increase training and expand trainee programmes, highlighting a significant investment in skill development in the sector as a key response to proficiency challenges. More staff appraisals (30 per cent) follows, suggesting that organizations are actively assessing performance to identify gaps and areas for improvement. Employers also notably increased recruitment (19 per cent) to overcome the challenges of finding fully proficient workers. Reallocation of work (18 per cent) and more supervision of staff/providing feedback

(17 per cent) are also notable measures. It is also noteworthy that none of the surveyed enterprises reported pursuing automation as a means of negating skill issues.

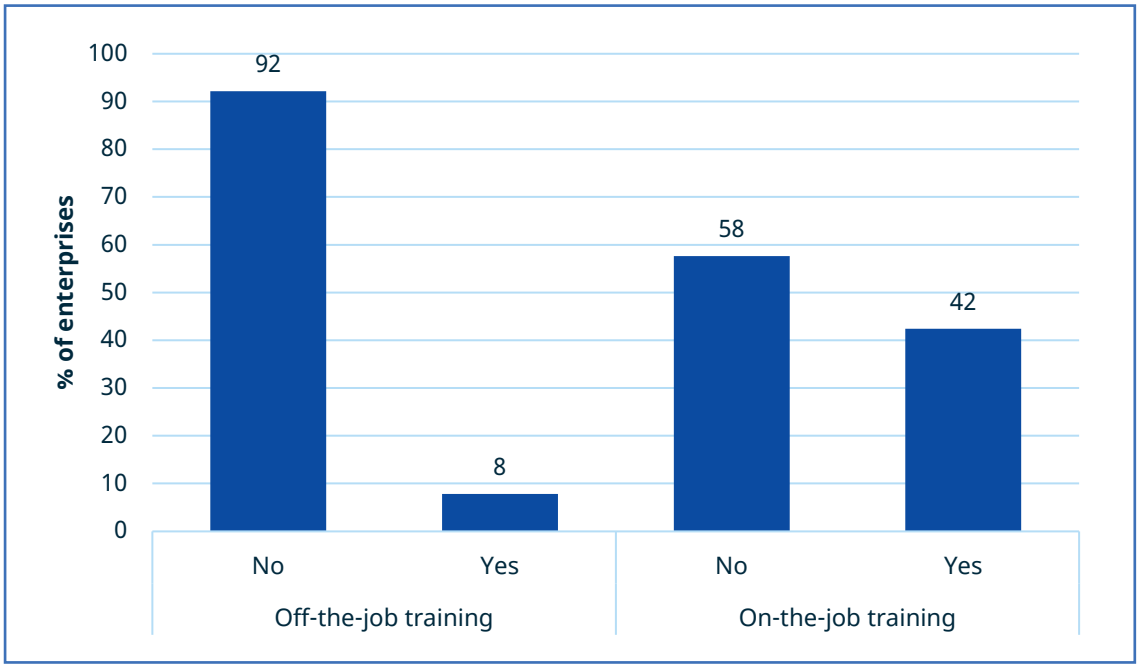
▶ Figure 108. Measures taken by enterprises to overcome challenges related to workers not being fully proficient (% of respondents, N=217)



Note: Multiple responses possible. Source: ESS 2023.

Figure 111 presents data on the prevalence of job training within enterprises. The chart shows that more than 90 per cent do not provide off-the-job training. By contrast, on-the-job training was much more common, with over 40 per cent of organizations utilizing it.

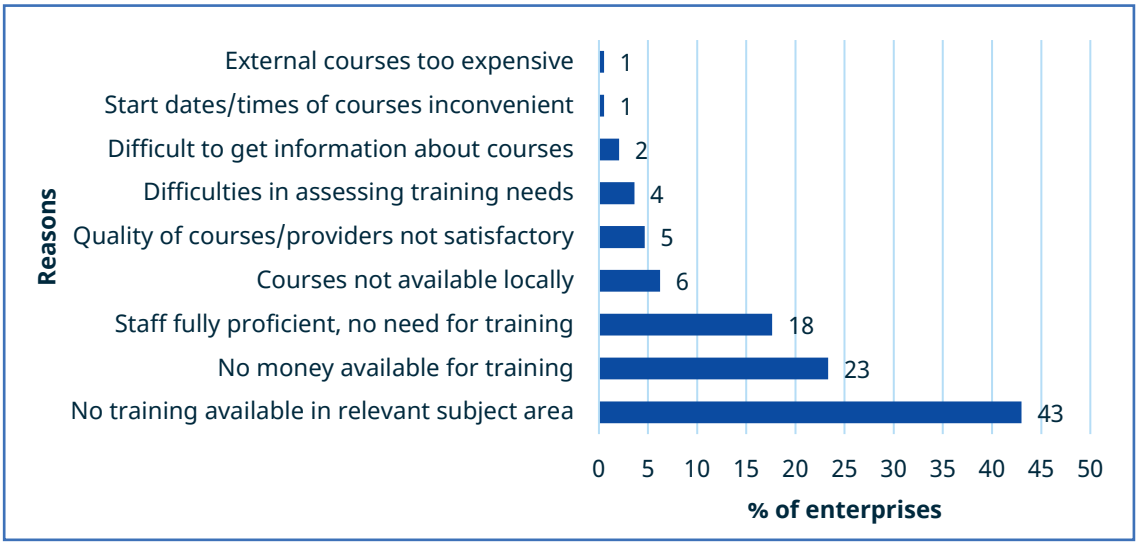
▶Figure 109. Enterprises' support for job training in last 12 months (% of respondents, N=217)



Source: ESS 2023.

Figure 112 offers insights into why organizations might not invest in workforce training. The leading reason, cited by 43 per cent of respondents, is "no training available in relevant subject area", suggesting a significant gap in the training market. Nearly 23 per cent of organizations reported "no money available for training", indicating financial constraints as a major barrier to employee development. In addition, 18 per cent of the respondents believed that all of their staff are fully proficient, and therefore, there was no need for training.

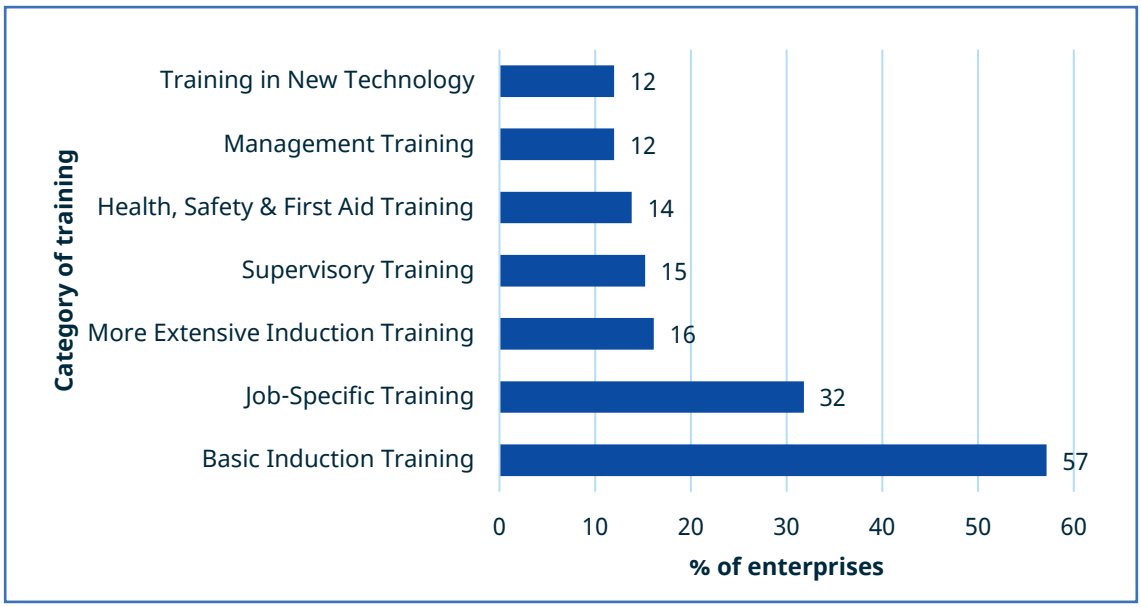
▶ Figure 110. Manufacturing enterprises' reasons for not providing/funding education or training (% of respondents, N=217)



Note: Multiple responses possible. Source: ESS 2023.

The findings from the survey suggest that basic induction (57 per cent) and job-specific training (32 per cent) are the most commonly arranged training types in the sector (figure 113). This highlights the sector's emphasis on equipping employees with the skills necessary for their specific roles. More extensive induction training and supervisory training were also arranged by a significant number of enterprises (16 per cent and 15 per cent, respectively).

▶Figure 111. Types of training arranged by manufacturing enterprises (% of respondents, N=217)



Note: Multiple responses possible. Source: ESS 2023.

▶ 5.6. Future labour and skills demand

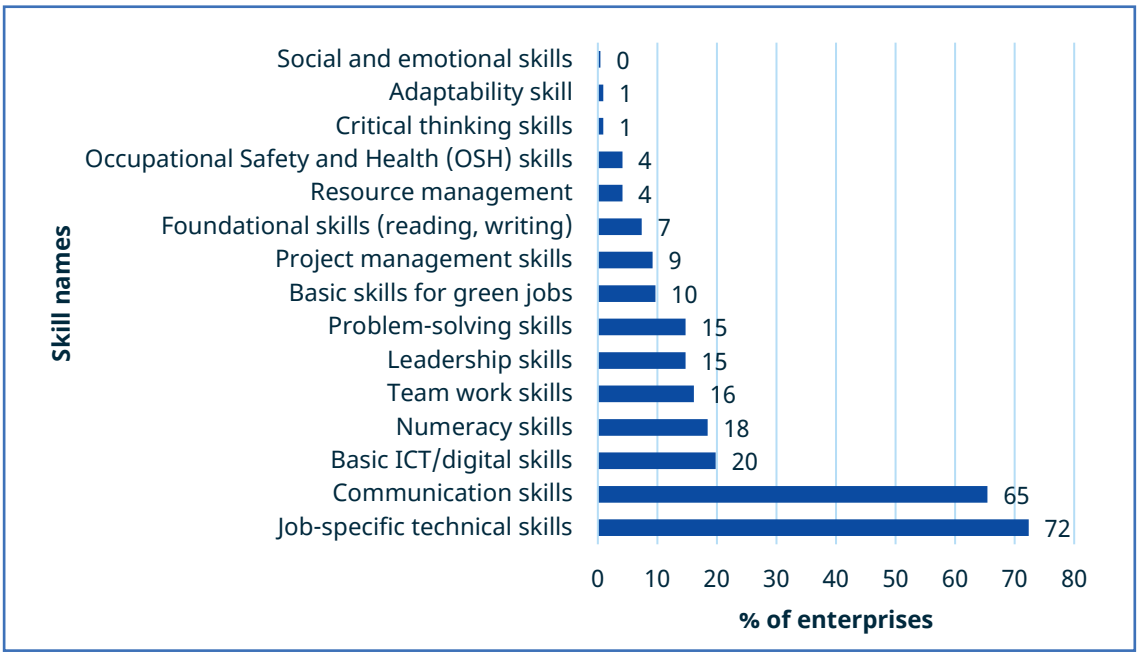
Figure 114 reflects the future workforce needs within the manufacturing sector as reported by enterprises, and provides an indication of which roles are expected to see increased demand in the future. Managers (34 per cent) and Sales and Marketing Executives (27 per cent) are the occupations that were most commonly cited, suggesting that the sector envisions a significant need for leadership and business development skills. Packaging Operators (24 per cent) and supervisor (21 per cent) also feature prominently, which is in line with the sector's core activities and represents a sense of continuity in terms of labour demand for technical positions in the sector, as both of these roles were prominently reported above as major occupations with sizeable numbers of vacancies to fill (see figures 103 and 104). The findings implies that future labour strategies should focus on strengthening the leadership and technical skills pipeline, ensuring a ready supply of skilled professionals in managerial, sales and technical roles to support the sector's growth and innovation needs.

▶ Figure 112. Occupations that will be in demand in the future, according to manufacturing enterprises (% of respondents, N=217)

Note: Multiple responses possible. Source: ESS 2023.

Findings from the survey suggest that job-specific technical skills (72 per cent) will the most in-demand skills moving forward (figure 115), suggesting a strong future need for specialized technical knowledge tailored to specific roles in manufacturing. Communication skills (65 per cent) were also highlighted, emphasizing the importance of clear and effective interpersonal communication within the industry. No other skills were anywhere nearly as like to be cited as the top two, but there were still a number of notable skills put forward by a sizeable minority of enterprises (15 to 20 per cent). This includes basic ICT/digital skills (20 per cent), which reflects the sector's increasing integration of technology into manufacturing processes. This was closely followed by numeracy skills (18 per cent), teamwork (16 per cent), leadership skills (15 per cent) and problem-solving skills (15 per cent), all of which are crucial for addressing the complex challenges that arise in a dynamic manufacturing environment.

▶ Figure 113. Skills that will be in demand in the future, according to manufacturing enterprises (% of enterprises, N=217)



Note: Multiple responses possible. Source: ESS 2023.

▶ 5.7. Vision for the future of the sector

The manufacturing sector consists of many major subsectors, each of which has its own ecosystem and stakeholders. Many subsectors have their own national policies and compliance regulations. Policy reformation and implementation will be crucial for future perspective plans and milestones.

The manufacturing sector will be at the core of achieving these milestones and perspective plans.

A vision statement has been developed as part of this study for the manufacturing sector to envision the future of the sector. The statement has been crafted by incorporating opinions and validation from relevant stakeholders in the sector. The development of the vision statement includes the following steps:

- 1. Opinions from sector stakeholders regarding how they want the sector to develop in the future were gathered. The stakeholders included industry experts, business enterprises, and employers' and workers' associations.
- 2. Based on these opinions, a draft vision statement was formed using the following guiding considerations:
    - sector policy availability and implementation;
    - domestic and international markets for the sector;

- the sector's competitiveness in terms of product and service quality, adherence to compliance, maintaining local and global standards, and ensuring environment friendly industrial processes;
- technology usage and adaptation;
- overall human resource development for all level of employees;
- sector-specific skill development of the workforce, including recognition of formal technical training;
- higher education for the manufacturing sector;
- peace building and conflict mitigation among the stakeholders within the sector.

3. The draft vision was articulated to the major stakeholders to validate.
4. After incorporating the feedback from the stakeholders, the vision statement was developed.

Vision statement for the manufacturing sector in the Chattogram–Cox's Bazar region

The manufacturing sector's aspiration is to position itself as a global leader renowned for its quality and innovation, excelling in the production and exportation of a diverse range of products that adhere to the highest standards. Its commitment extends beyond merely enhancing productivity and efficiency; it is equally dedicated to addressing environmental and social challenges. The well-being and safety of the manufacturing workforce, the backbone of the sector, hold paramount importance to the sector.

Empowered with the requisite skills, technology and knowledge, the manufacturing workforce is poised to excel in their roles. Recognizing the significance of digitalization, the sector strives to seamlessly integrate technology, automation and data into its manufacturing processes. This not only fosters job creation, but also elevates skill development.

To realize its vision, robust government support is imperative. A comprehensive industrial policy, export policy, and the establishment of a dedicated industrial park are integral components of this support. Together with different stakeholders, the sector can forge a future where manufacturing becomes a source of pride and a foundational pillar of the economy.

The vision statement incorporates all the major factors necessary to ensure sustainability and sustainable growth in the manufacturing industry of the Chattogram–Cox's Bazar region.

▶ 5.8. Gaps in the capabilities and skills needed to achieve the vision for the future

The manufacturing sector in the Chattogram–Cox's Bazar region suffers from some major business capability gaps, and if these are not resolved, the sector might find it difficult to reach its vision. These gaps include:

Low productivity and efficiency

The manufacturing sector suffers from low productivity and efficiency. Due to this, it predominantly produces low-value-added products and cannot keep pace with its rivals in countries such as Viet Nam and Cambodia. It needs updated machinery and more skilled manpower to produce high-value-added products.

Compliance issues

The manufacturing sector lags behind in terms of maintaining compliance with environmental and social standards and regulations, both at the national and international levels. Compliance issues refer to the extent to which the manufacturing sector adheres to the legal and ethical requirements or expectations of the relevant authorities and stakeholders, such as the Government, customers, workers and civil society. Compliance issues can be found in multiple areas, such as pollution, greenhouse gas emissions, waste management, occupational health and safety (OSH), labour rights, and gender equality.

Human resource planning and recruitment

The manufacturing sector sees high worker turnover and needs a constant supply of workers to maintain productivity. However, the sector frequently faces crises in retaining existing workers and onboarding potential workers. Well-managed and well-planned human resources units can solve these problems and ensure non-disruption of ongoing production.

Forward market linkages

The sector faces challenges in channeling effective forward market linkages, which means that it has limited access and connections to the domestic and international markets where its products are sold. This affects the competitiveness, profitability and sustainability of the sector. The sector needs a skilled workforce engaged in communications, client management, marketing and branding.

Product innovation

The manufacturing sector in Bangladesh has a low level of product innovation, which means that it produces and exports a narrow range of products, mostly low-value and labour-intensive goods, such as garments, textiles, leather and jute. This limits the diversification and value addition of the sector, which are essential for meeting changing customer expectations and preferences, as well as for creating new market opportunities. Some of the factors that hinder product innovation are the lack of skilled workers for research and development, and the lack of skilled workers for market research and promotion.

Incorporation of digitization

The sector demonstrates a low trend of adopting technologies and digitization. This reduces the potential productivity, efficiency, quality and innovation of the sector, as well as its ability to adapt to rapid and disruptive changes in the global market. The sector needs a robust skilled workforce in social media and website management, e-payment operation and management, and online financial management.

Table 23 below provides a snapshot of business capability gaps and the skills needed to address these gaps in manufacturing sector.

▶Table 24. Skills needed to address major business capability gaps in the manufacturing sector

Capability gap	Skills needed to address gap	Related occupations
Low productivity and efficiency	▶ Skill on modern technology operation and maintenance ▶ Skill on maximizing efficiency and productivity ▶ Skill on quality assurance	▶ Machine Operators ▶ Mechanical Technicians ▶ Quality Controllers ▶ Managers ▶ Supervisors
Compliance issues	▶ Skill on waste management ▶ Skill on occupational safety and health (OSH) ▶ Skill on decent work and labour rights	▶ Managers ▶ Supervisors ▶ All other occupations
Human resource planning and recruitment	▶ Skill on human resource planning ▶ Skill on recruitment and onboarding ▶ Skill on employee retention	▶ HR Managers ▶ Managers ▶ Supervisors
Forward market linkages	▶ Skill on communication and client management ▶ Skill on Marketing ▶ Skill on Branding	▶ Managers ▶ Supervisors ▶ Sales and Marketing Executives
Product innovation	▶ Skill on research and development (R&D) ▶ Skill on product marketing and promotion ▶ Skill on market research	▶ Managers ▶ Supervisors
Incorporation of digitization	▶ Skill on social media and website management ▶ Skill on e-payment operations and management ▶ Skill on online financial management	▶ Communication Officer ▶ Finance officer ▶ IT professional

▶ 5.9. Skills supply findings

5.9.1. Supply of skills

One of the major objectives of the study was to determine the available manufacturing-related skills programmes and training courses in the Chattogram–Cox's Bazar region. Table 24 below shows the key skills training available related to the manufacturing sector by certification level in the Chattogram region and in Cox's Bazar.

▶ Table 25. Available manufacturing sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level

Programme level	Trade/specialization programmes available	
	Chattogram region	Cox's Bazar
Diploma	Civil (Wood) Technology Electronics Technology Mechanical Technology Power Technology	Food Technology
HSC (Voc)	Argo Machinery Electronic Control and Communication Electrical Works	Automotive
SSC (Voc)	Electronics Workshop and Maintenance Firm Machinery General Electronics General Mechanics Mechanical Drafting	General Electronics General Mechanics
NSC (Levels 1–5)	Consumer Electronics Electrical and Electronics Electronic Works Furniture and Cabinet Making General Electronics Machine Shop Practice Mechanical Engineering Mechanical Fitter Mechanical Technology	Electronic Works
Informal certificate course	Electrical and Electronics Electronic Works General Electronics Machine Shop Practice Mechanical Technology Wood Furniture Making	Electronic Works Handicrafts Reusable Sanitary Wood Technology

At the diploma level, four manufacturing-related courses were found to be present in Chattogram region, but just one diploma course (Food Technology) was available in Cox's Bazar. There are a few courses available at the HSC (Voc) level in the Chattogram region, but Cox's Bazar does not offer any manufacturing courses at the HSC level. There are, however, two SSC (Voc) courses offered in Cox's Bazar. Most of the manufacturing-related courses are available at the NSC level or through informal certificate providers. But again, Cox's Bazar lags behind the Chattogram region, with only one NSC course compared to Chattogram's nine.

5.9.2. Types of TVET institutions surveyed

Of the 202 TVET providers that participated in the skills supply survey, 55 stated that they provide training courses related to manufacturing. Table 25 below shows the number of TVET providers offering manufacturing-related training, by the owner/operator of the provider.

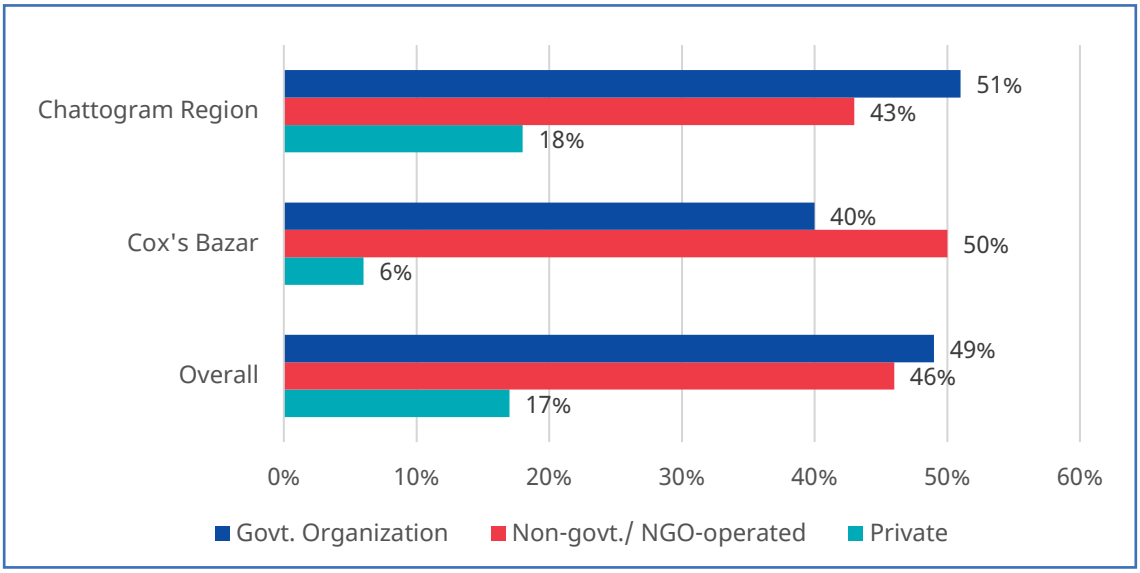
▶ Table 26. Share of surveyed TVET providers offering manufacturing-related courses, by owner/operator of the provider

Region	No. of TVET providers surveyed	No. of manufacturing-related courses available
Chattogram region	166	45
▶ Government-operated	41	20
▶ Non-govt/NGO-operated	16	6
▶ Private	109	19
Cox's Bazar	36	10
▶ Government-operated	10	4
▶ Non-govt/NGO-operated	10	5
▶ Private	16	1

Overall, 45 TVET providers in Chattogram region reported offering manufacturing-related training courses, and 10 TVET providers from Cox's Bazar reported offering manufacturing-related training courses. Figure 116 below translates the above table into percentage format and shows the availability of manufacturing courses in the Chattogram region and Cox's Bazar based on the owner/operator of the provider.

Among the government-run TVET providers surveyed, almost half (47 per cent) offer manufacturing-related courses; whereas a slightly smaller share (42 per cent) of NGO-operated providers stated that they provide such courses. Private TVET providers were much less likely to offer manufacturing-related courses, with this only being the case for 16 per cent of providers overall – with just one surveyed provider in Cox's Bazar offering such courses.

▶ Figure 114. Prevalence of manufacturing-related courses in surveyed TVET providers, by owner/operator of the provider (%)

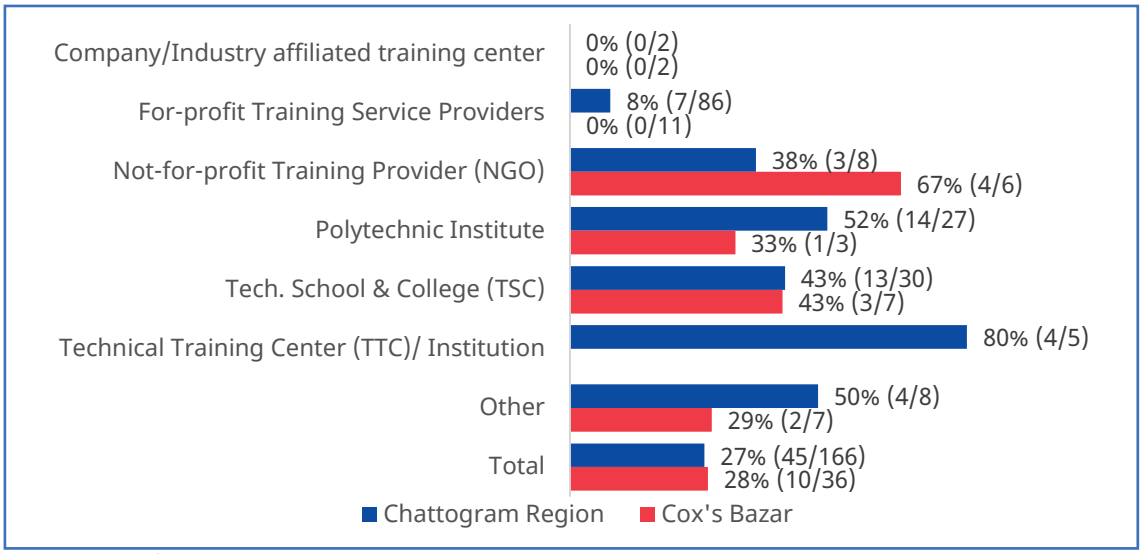


Source: Survey of TVET providers.

In Cox's Bazar, 67 per cent of not-for-profit TVET providers offer manufacturing courses; while this is the case for just 38 per cent of not-for-profit providers in the Chattogram region (figure 117). However, there are many more manufacturing course opportunities among for-profit providers, TSCs, TTCs, polytechnics and other institutions in the Chattogram region compared to cox's Bazar. For instance, just one of the three polytechnics surveyed in Cox's Bazar provides training courses related to manufacturing, as opposed to 14 of the 27 polytechnics surveyed in the Chattogram region.

It was noted in the FGDs and KIIs that Cox's Bazar essentially lacks a manufacturing industry; while – as noted above – the sector is very strongly established in the Chattogram region. This goes a long way to explaining the lack of manufacturing-related courses in Cox's Bazar compared to the Chattogram region. During FGD it was also discovered that NGO-operated TVET providers basically provide manufacturing training to support people in starting their own businesses rather than working in the industry as an employee.

▶Figure 115. Prevalence of manufacturing-related courses in different type of providers



Source: Survey of TVET providers.

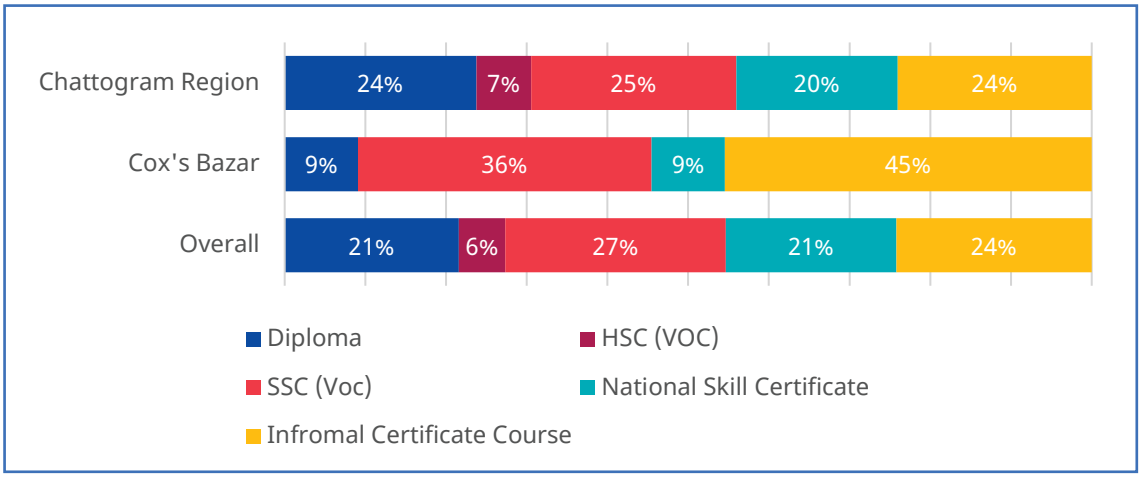
5.9.3. Level of skills programmes available

Manufacturing courses are more or less available at all levels of certification. Overall, 21 per cent of manufacturing courses are being offered at the diploma level, 6 per cent at the HSC (Voc), 27 per cent at the SSC (Voc) level, and 21 per cent under the NSC. An additional 24 per cent of courses only award informal certificates.

The largest share of the courses in cox's Bazar are offered under informal certification (45 per cent), with only one course being offered at the diploma level and a larger proportion of courses (36 per cent) being offered at the SSC (Voc) level. There are no HSC (Voc) level courses on offer from the surveyed providers in Cox's Bazar.

In the Chattogram region, manufacturing courses are available at all levels of certification. Diploma courses account for 24 per cent of courses; HSC (Voc) for 7 per cent; SSC (Voc) for 25 per cent; NSC for 20 per cent; and informal certificate courses for 24 per cent.

▶Figure 116. Level of the manufacturing-related skill programmes available



Source: Survey of TVET providers.

5.9.4. Qualifications relevant to the sector

Based on the primary research with TVET providers and intermediaries, the study team found that for the manufacturing sector, typically occupations can be categorized into four groups: (i) managerial; (ii) technical; (iii) operational; and (iv) administrative. For each group of occupations, the qualifications are different, as follows:

For **entry-level managerial positions,** one may need to hold a bachelor's or master's degree as an educational qualification as well as interpersonal skills; leadership, planning and decision-making skills; and knowledge of the manufacturing industry, markets and regulations.

For **technical positions,** one needs to have a bachelor's or diploma degree in engineering. Holders of these positions will be responsible for designing, testing and improving manufacturing products and processes.

In **operational positions,** most of the workforce are floor-level employees. They are responsible for production and machine operation. Employees for these positions may need to have HSC or SSC certification or skills certificate equivalent to NSC levels 2–3. Those who have informal certification may also find a way to enter into these positions.

For **entry-level administrative positions,** a bachelor's or master's degree is preferred. As jobs in this category require less technical knowledge, diploma holders will find it difficult to utilize their educational background for these positions.

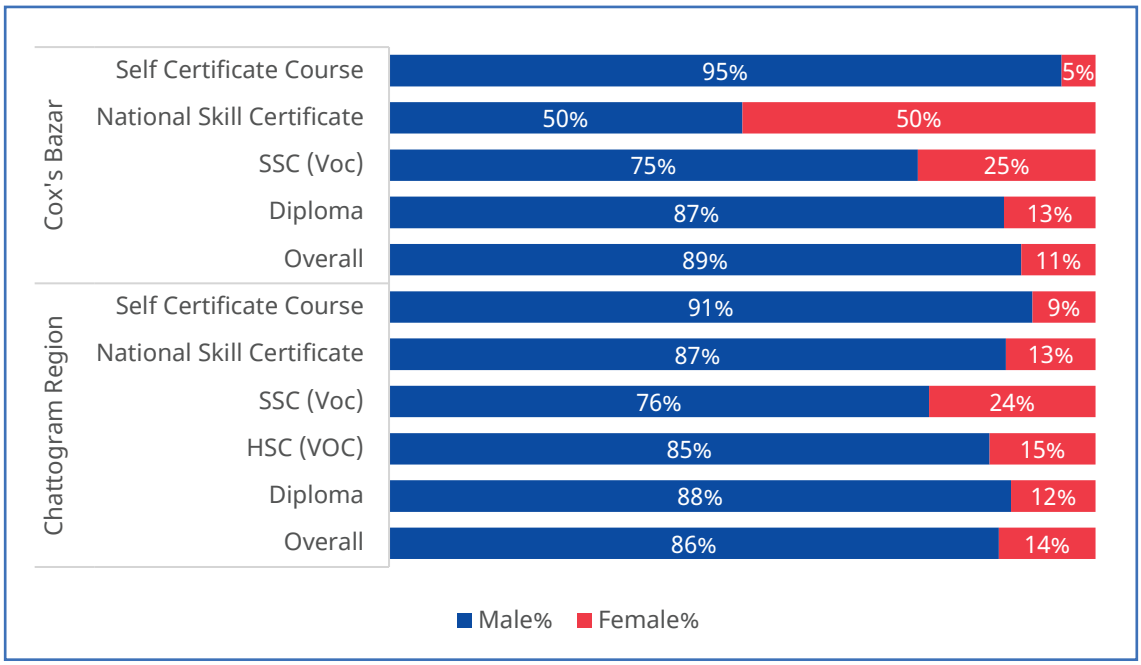
5.9.5. Enrolment status by sex

Among the currently enrolled students, a ratio of males and females was identified. Figure 119 shows the ratio of male and female participants in manufacturing courses for all levels of skills certification in the Chattogram region and in Cox's Bazar.

Overall, a small share of enrolled trainees in the Chattogram region (14 per cent) are female. The highest share of participation by female trainees in the Chattogram region can be seen at the SSC (Voc) level (24 per cent). Female participation is lowest in informal programmes (9 per cent). At the diploma level, it was reported that just 12 per cent of students are female. The manufacturing sector employs very large numbers of female workers, particularly the readymade garment industry, but in most cases, the jobs held by these female workers do not require any formal certification. As a result, the participation of females in manufacturing courses seems to be quite low.

In Cox's Bazar the situation is much the same as in the Chattogram region. Overall, just 11 per cent of training course participants are female. Although figure 119 shows that 50 per cent of the enrolled trainees in NSC programmes are female, there was actually only one such course available among the surveyed TVET providers in Cox's Bazar. This lone course was offered by an NGO-operated TVET provider, and only had 20 trainees, 10 of whom were female.

▶ Figure 117. Ratio of male and female trainees enrolled in manufacturing-related programmes, by training programme level (%)



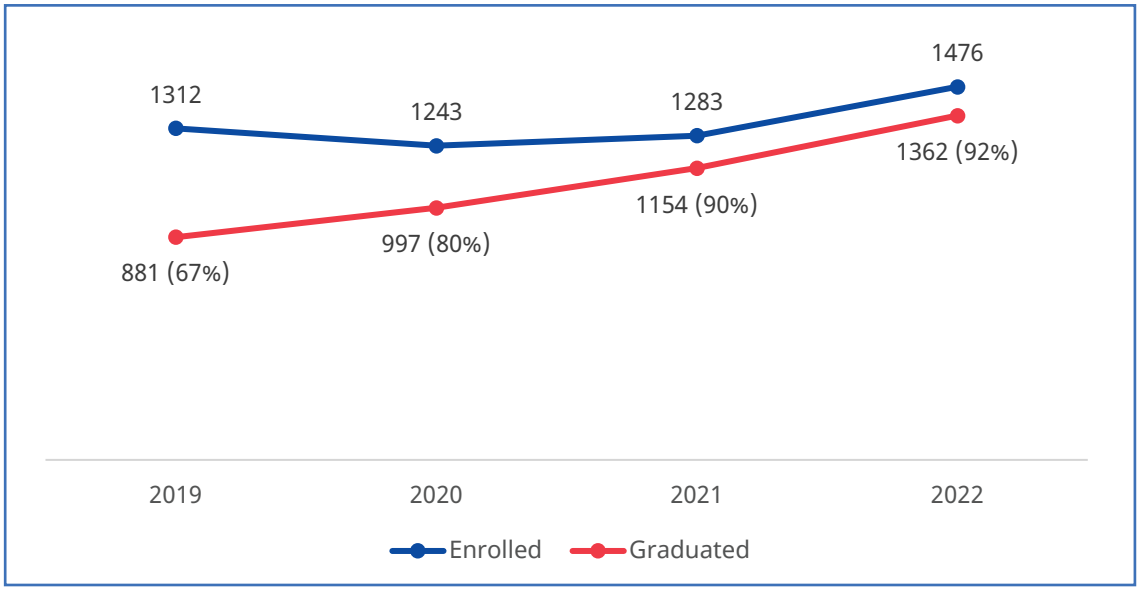
Source: Survey of TVET providers.

5.9.6. Number of graduates

Graduation numbers for manufacturing-related courses show an upward trend in both Chattogram and Cox's Bazar in recent years. Figures 121 and 122 below depict BTEB enrolment and graduation data for HSC (Voc), SSC (Voc), Dakhil (Voc), and 360 short courses for the years 2019–2022. As can be clearly observed, the Chattogram region has a continuous year-on-year increase in the number of manufacturing course graduates, with numbers growing from 881 graduates in 2019 to 1,362 in 2022 – a 54 per cent increase. Also of note, TVET providers in the Chattogram region have improved their capacity to retain students, with graduate rates improving from just 67 per cent in 2019 to 92 per cent in 2022. Indeed, providers saw a 5 per cent drop in enrolments between 2019 and 2020, but the number of graduates still increased by 13 per cent over the same period.

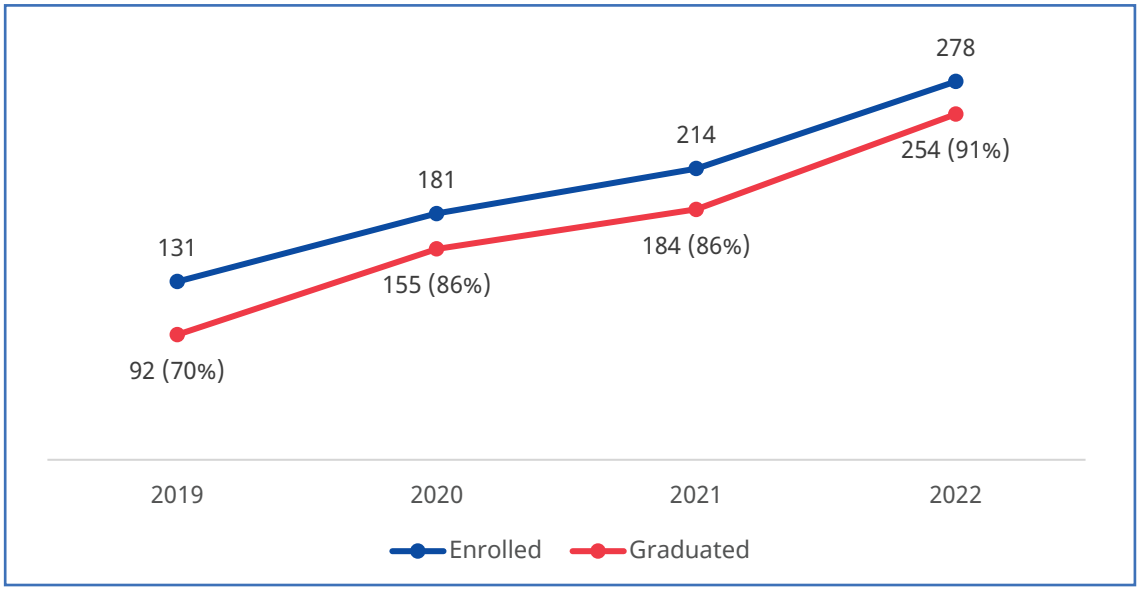
A similar situation is observed in Cox's Bazar, with the number of graduates from manufacturing courses grew by about 57 per cent over the 2019–22 period. This trend of increasing numbers of TVET graduates depicts a positive trend in terms of supplying trained workers for the manufacturing sector in both the Chattogram region and Cox's Bazar.

▶ Figure 118. Enrolment and graduation numbers for manufacturing-related programmes in the Chattogram region, 2019–22



Source: Survey of TVET providers.

▶ Figure 119. Enrolment and graduation numbers for manufacturing-related programmes in Cox's Bazar, 2019–22



Source: Survey of TVET providers.

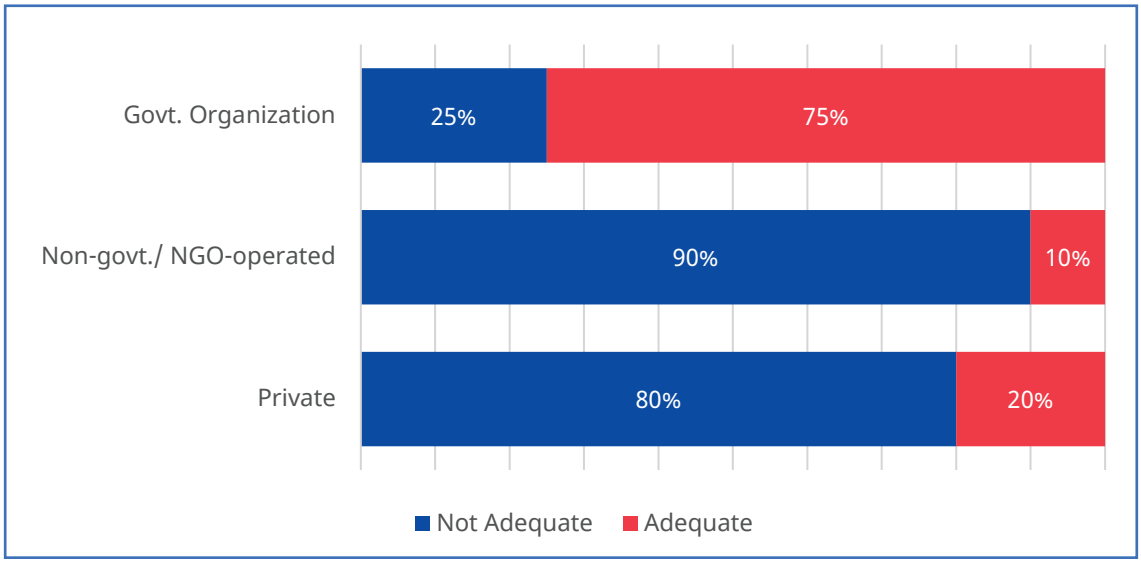
5.9.7. Adequacy of TVET providers' equipment

Figure 122 shows the adequacy of the equipment used by TVET providers for manufacturing-related courses. According to the NGO-operated TVET providers surveyed, 90 per cent said they do not have adequate equipment for manufacturing courses. Because NGOs typically run their courses based on

donor funds, they tend to only buy or outsource equipment on a need basis. As a result, they frequently do not own much equipment on a permanent basis.

The scenario is almost the same for for-profit training providers, 80 per cent reporting that do not have the required equipment for manufacturing training. Government-run TVET providers are more likely to report possessing the necessary equipment for manufacturing training, with this being the case for 75 per cent of the government-run providers surveyed.

▶ Figure 120. Adequacy of training equipment in manufacturing-related training programmes, by type of TVET provider (%)



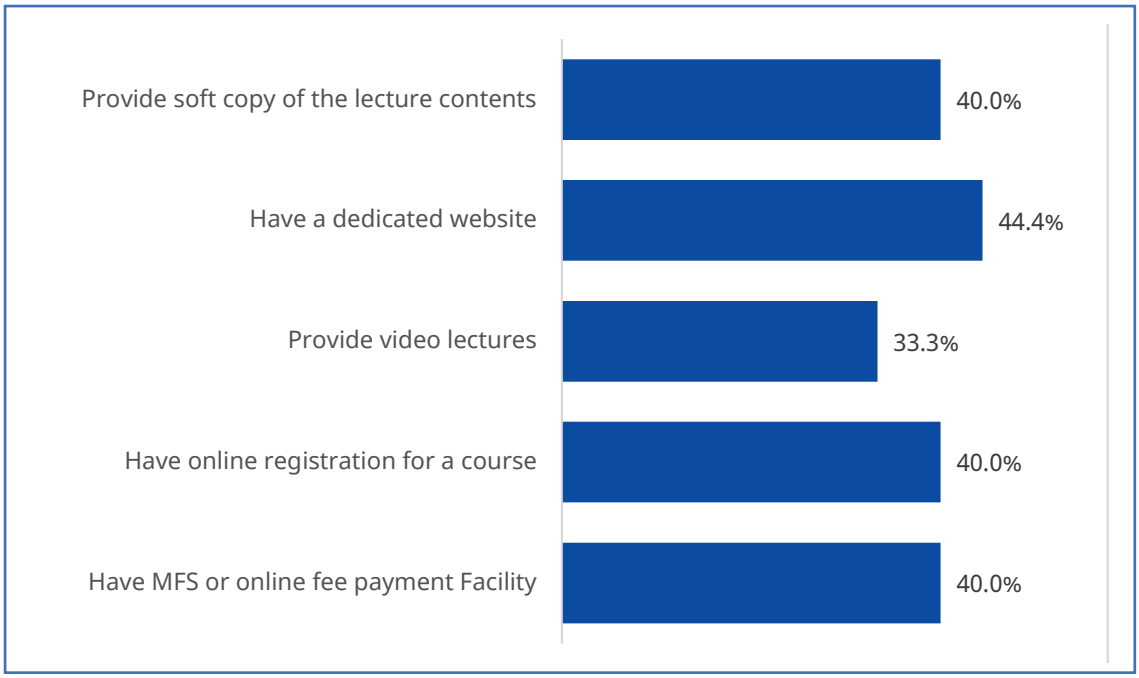
Source: Survey of TVET providers.

5.9.8. Digitization of TVET services

Following the emergence of COVID-19, the digitization of services has become a major requirement for quality training. In the Chattogram–Cox's Bazar region, only a minority of TVET providers offering manufacturing-related courses supply digital services. The most commonly reported digital services among these providers include providing video lectures, having websites, providing soft copies of lectures, and providing opportunities for online course registration. One-third of the surveyed TVET providers (33 per cent) stated that they provide video lectures, by which they mean Facebook Live videos, YouTube videos, and online classes as video lectures.

MFS, or online money transfer, has become a burning need for every industry. In the Chattogram–Cox's Bazar region, 40 per cent of manufacturing TVET providers are able to receive course fees by mobile banking or online banking. However, a few of the TVET providers who do not currently offer such services did express their interest in adopting MFS or online banking for collecting course fees.

▶ Figure 121. Digitization status of TVET providers in regard to manufacturing sector-related programmes (%)



Source: Survey of TVET providers.

5.9.9. Status of facilities available at TVET providers

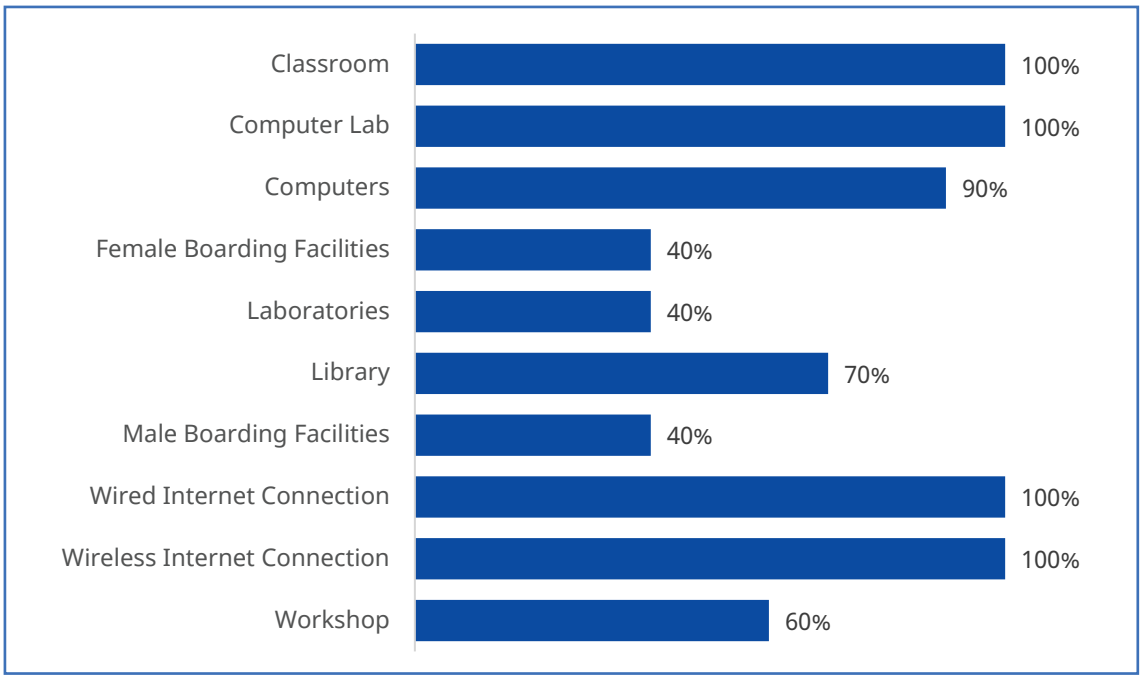
To ensure good education and training, TVET providers must ensure that they have a at least a few basic facilities, such as proper classrooms, computers with internet access, and boarding facilities. Figure 124 below presents some commonly required facilities for TVET providers, and the prevalence of these facilities among providers in the Chattogram–Cox's Bazar region offering manufacturing-related courses.

All of the TVET providers providing training in manufacturing occupations reported having wired or wireless internet connections. Most (90 per cent) also have computer labs, as many TVET providers offer ICT courses. Sixty per cent mentioned that they have workshops to provide hands-on training to their trainees in manufacturing courses.

More importantly, 40 per cent of the TVET providers have boarding facilities for their trainees, both male and female. However, the boarding facilities are not dedicated only to manufacturing course trainees. Furthermore, most government TVET providers offer boarding facilities.

Most of the TVET providers raised concerns about the scarcity of facilities. According to them, if they can expand their facilities, they can accommodate more trainees and provide higher quality training.

▶ Figure 122. Facilities available in TVET providers offering manufacturing sector-related programmes (%)



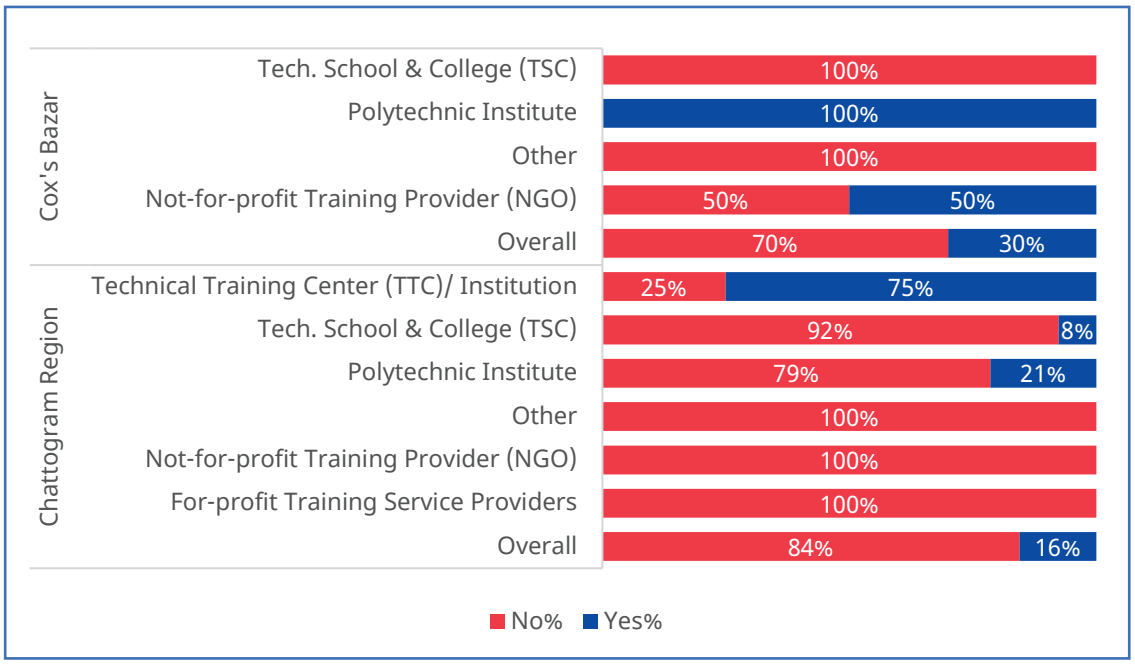
Source: Survey of TVET providers.

5.9.10. TVET providers' capacity to provide Recognition of Prior Learning

Many employees in the manufacturing sector work in the sector for a long time without having any formal certification. There should be great scope for RPL programmes to give recognition to the skills that these individuals have developed over the course of their working lives.

Figure 125 shows the proportion of TVET providers offering RPL for manufacturing-related courses in Cox's Bazar and in the Chattogram region. Overall, the availability of RPL among TVET providers offering manufacturing courses is limited, with just 16 per cent of TVET providers across the region offering such opportunities. In Cox's Bazar, the survey found that the one polytechnic that offers a single manufacturing-related diploma course also provides RPL (which is why the figure below has 100 per cent for polytechnics). Moreover, half of the not-for-profit TVET providers in Cox's Bazar have RPL. In the Chattogram region, 75 per cent of TTCs, 21 per cent of polytechnics and 8 per cent of TSCs offer RPL for manufacturing programmes.

▶ Figure 123. Status of manufacturing-related RPL offerings in TVET providers, by type of provider (%)

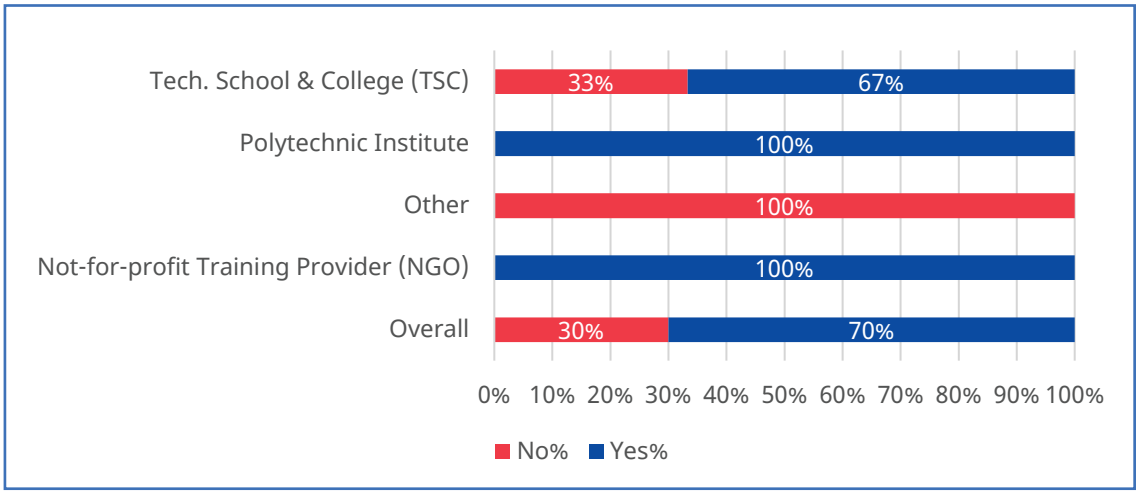


Source: Survey of TVET providers.

5.9.11. TVET provider collaborations/linkages with CBOs, NGOs and social organizations

The sustainability of TVET providers largely relies on their cooperation and connection with community and social organizations. Most of the TVET providers (70 per cent) in the Chattogram–Cox's Bazar region that offer manufacturing-related training reported that they have some sort of relationship, partnership or understanding with various NGOs, CBOs and/or social organizations, with this being the case for 100 per cent of the not-for-profit providers and polytechnic institutes. Furthermore, most of the TSCs (67 per cent) also said that they have a collaborative relationship with communities and community-based organizations.

▶ Figure 124. Status of collaboration by TVET providers with CBOs, NGOs and social organizations on manufacturing-related programmes (%)

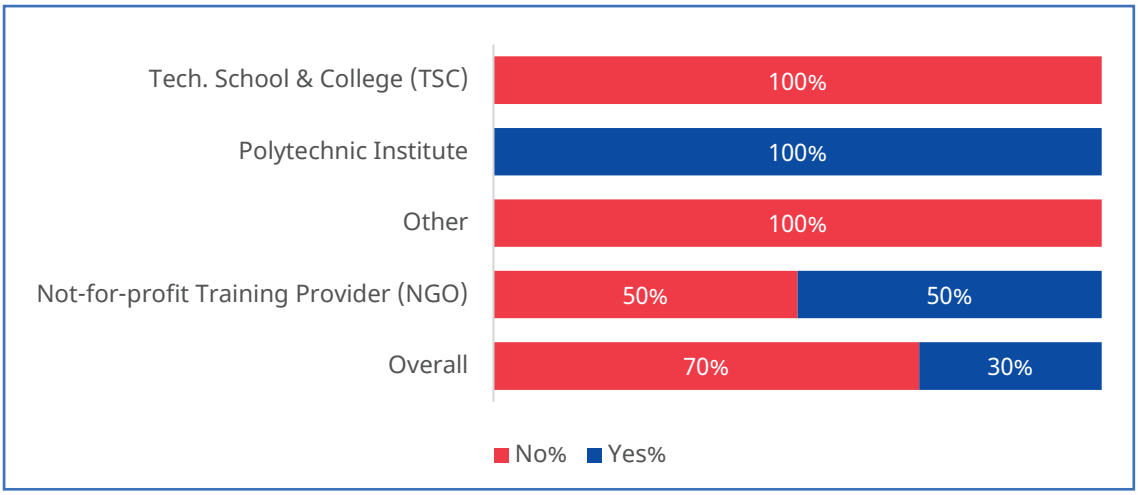


Source: Survey of TVET providers.

5.9.12. Share of TVET providers with placement cells for graduates

Placement cells act as a bridge for graduates to secure employment in industries related to the training they received. In the Chattogram–Cox's Bazar region, just 30 per cent of TVET providers said that they have a working placement cell for graduates of manufacturing-related courses. All of the polytechnics offering manufacturing courses reported have placement cells, which is unsurprising given that this is compulsory for government-run polytechnics. In addition, a number of the larger not-for-profit TVET providers also reported having placement cells; in all, half (50 per cent) of the not-for-profit providers said they have placement cells. None of the other types of TVET provider have formal placement cells, but many TVET providers do still engage in some informal placement activity, typically through personal connections and long-standing relationships with employers.

▶ Figure 125. Share of TVET providers offering manufacturing-related programmes that have placement cells for graduates (%)

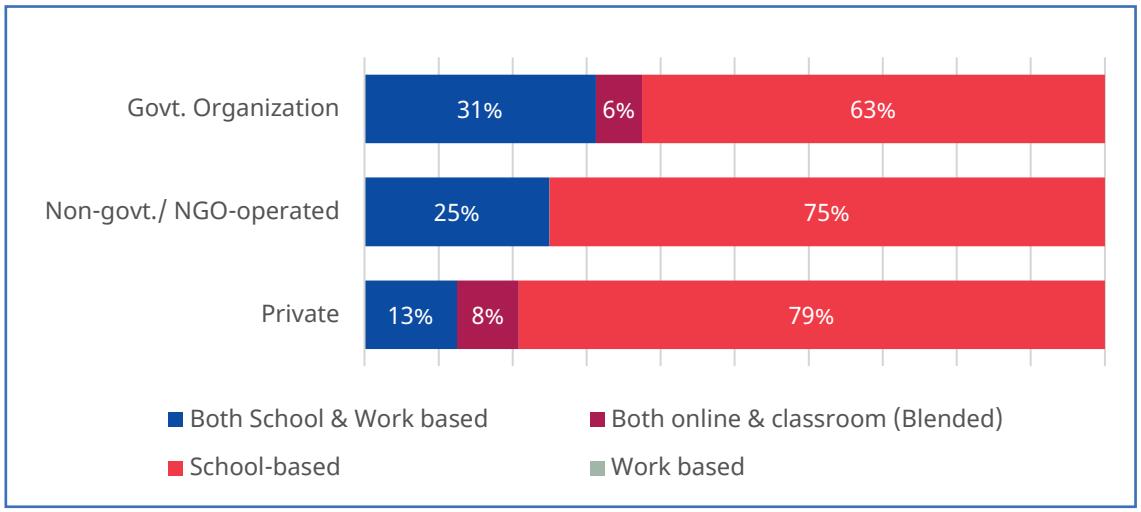


Source: Survey of TVET providers.

5.9.13. Course delivery mechanisms

To deliver courses, TVET providers normally follow a school-based approach, and this was certainly the case among providers offering manufacturing courses, with every provider reporting that at least some of each course being taught in the classroom. For a majority of surveyed TVET providers, all of the learning in their manufacturing-related courses was done in the classroom, with this being the case for 79 per cent of private TVET providers, 75 per cent of not-for-profit providers and 63 per cent of government-run providers. Learning by doing is one of the most important aspects of technical education; however, the use of work-based learning was relatively limited among providers, even though a combination of classroom learning and work-based learning was the second-most common approach used by TVET providers for manufacturing courses. In all, just 31 per cent of government-run providers, 25 per cent of not-for-profit providers, and 13 per cent of private providers used a classroom learning and work-based learning approach. Online learning was rarely employed for manufacturing courses, with just 6 per cent of government-run providers and 8 per cent of private providers using a blend of classroom and online learning.

▶ Figure 126. Course delivery method for manufacturing sector-related TVET programmes, by owner/operator of the TVET provider (%)



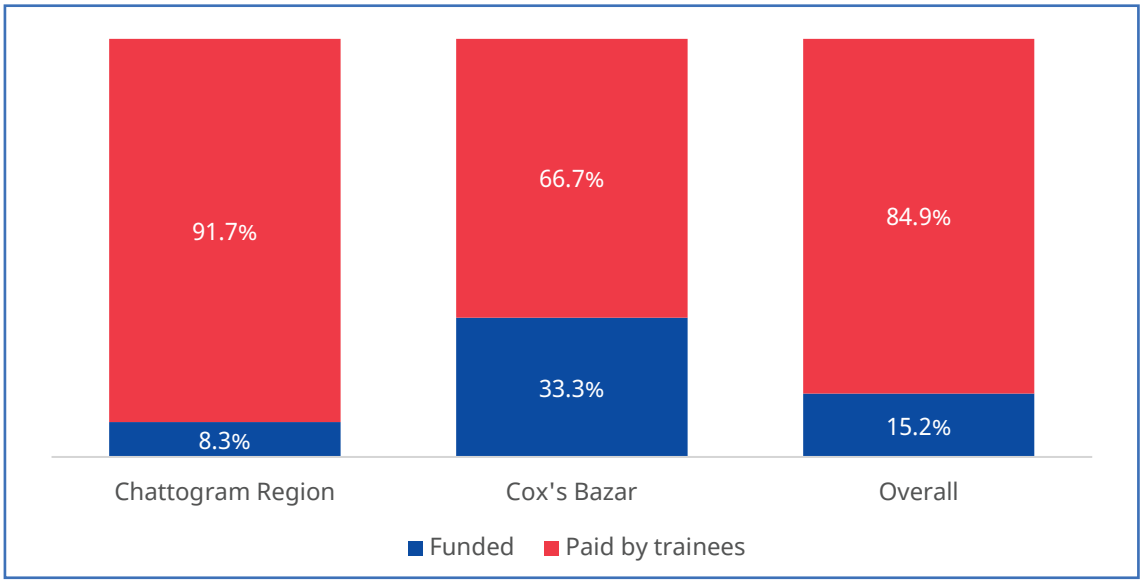
Source: Survey of TVET providers.

5.9.14. Source of tuition fees for courses

One-third of the manufacturing sector courses (33.3 per cent) in Cox's Bazar are funded by donor organizations or the government. However, in the Chattogram region, this was the case for just 8.3 per cent.

In surveys and KIIs, for-profit TVET providers raised concerns about the sustainability of manufacturing education in Cox's Bazar if courses continue to be offered free of cost to all cohorts of trainees. However, they also noted that because Cox's Bazar is one of the most vulnerable areas of Bangladesh, funding support may need to continue for a few years, but only for financially vulnerable students and marginalized communities.

▶Figure 127. Source of tuition fees for manufacturing-related TVET programmes (%)



Source: Survey of TVET providers.

5.9.15. TVET providers' support services

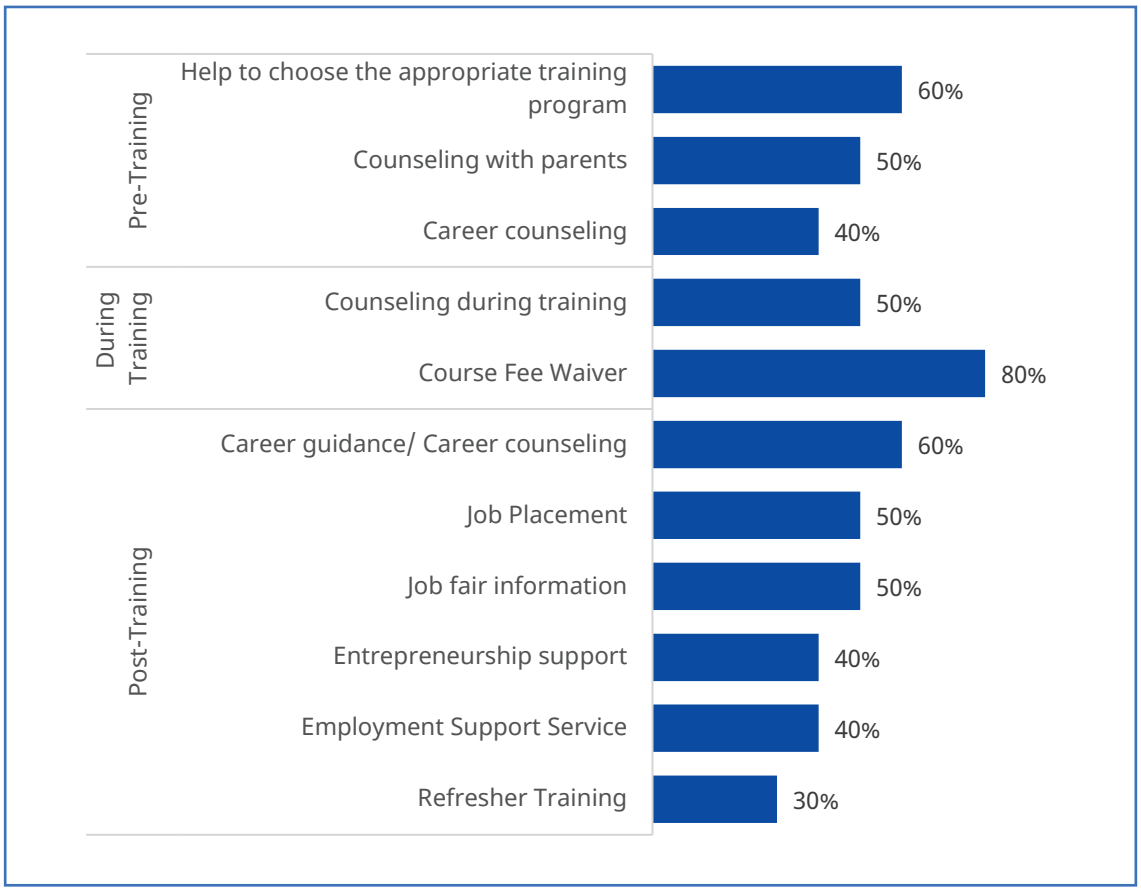
TVET providers in the Chattogram–Cox's Bazar region offer a few pre- and post-training support services for trainees in manufacturing courses. They also provide some support services during training.

The most commonly reported pre-training support services were vocational guidance, counseling with parents, and career counseling. A majority of providers (60 per cent) stated that they help to potential trainees to choose the appropriate training programme (vocational guidance). In addition, 40 per cent also mentioned providing career counseling as a pre-training support service.

In regard to services delivered during training, 50 per cent of providers mentioned said they offer career counseling to the trainees during their course. Moreover, 80 per cent of providers said they consider course fee waivers for trainees, if needed.

Career guidance was the most commonly reported post-training support service provided (60 per cent of providers). A number of TVET providers also reported efforts aimed at securing jobs for graduates, with half of the providers offering job placement services; 40 per cent offering employment support services; and 50 per cent supplying job fair information. In addition, 30 per cent of providers reported offering refresher training.

▶ Figure 128. Support services available at TVET providers offering manufacturing-related programmes



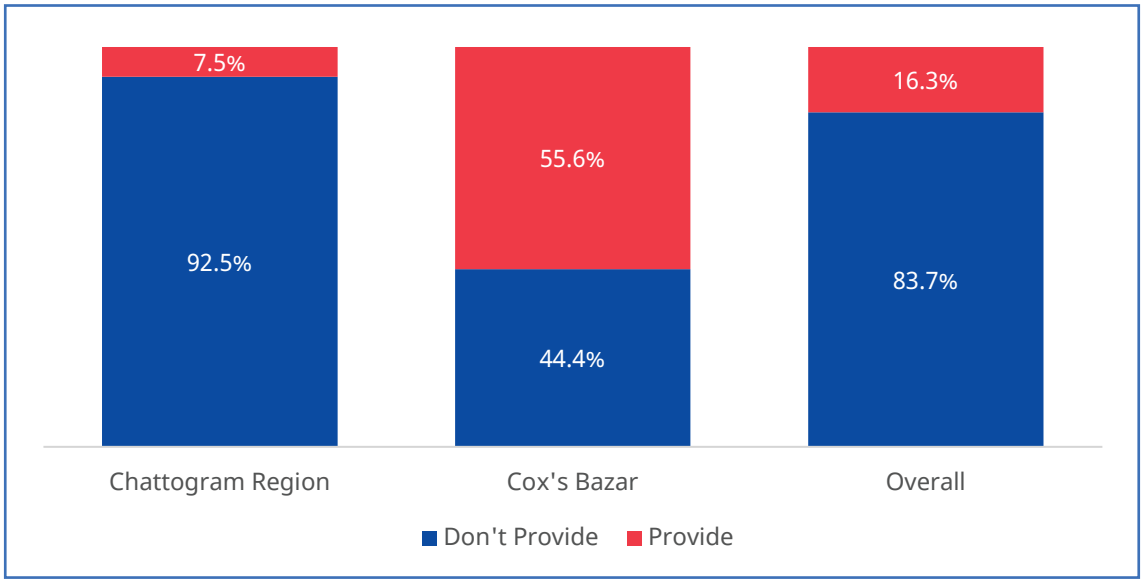
Source: Survey of TVET providers.

5.9.16. Status of work-based learning, including apprenticeships

Formal apprenticeships are crucial in technical and vocational education, however, it was found that there were no formal apprenticeships available in the targeted areas. Even so, a few TVET providers (16.3 per cent) reported arranging apprenticeships for their manufacturing trainees, but these were very informal in nature..

In the Chattogram region, only 7.5 per cent of TVET providers offered informal apprenticeship opportunities as part of their manufacturing courses. However, TVET providers in Cox's Bazar seemed more enthusiastic about arranging apprenticeships for their trainees, with 55.6 per cent of providers claiming that they try to arrange informal apprenticeships for their manufacturing trainees. It should be noted, however, that the terms "apprenticeship" and "internship" are sometimes used interchangeable by TVET providers.

▶ Figure 129. Availability of apprenticeship opportunities linked to manufacturing-related TVET programmes (%)



Source: Survey of TVET providers.

5.9.17. Internal factors affecting the sustainability of TVET providers

Table 26 below lists a few of the internal factors that can affect the organizational sustainability of a TVET provider, and provides an overview of the presence of these factors in providers offering manufacturing-related courses.

▶ Table 27. Presence of internal factors affecting the sustainability of TVET providers offering manufacturing-related courses

Internal factor	For-profit TVET providers	Not-for-profit TVET providers (NGO)	TSCs	Polytechnic institutes
Have a strategic plan/ long-term plan	50%	50%	100%	100%
Have annual work/ operational plan for employees	75%	50%	100%	100%
Have a separate HR department	50%	100%	0%	100%
Have HR policy	75%	50%	0%	100%
Have a separate accounts department	75%	100%	100%	100%
Perform internal financial audit	50%	100%	100%	100%
Audited by an external auditor	25%	100%	100%	100%

TSCs = Technical schools and colleges. Source: Survey with TVET Providers

TVET providers offering manufacturing-related courses were asked about their organizational structure and management, such as having a strategic plan, a separate HR department, a separate accounts department, and conducting financial audits. These factors indicate how well a TVET provider operates, and therefore, its chances for sustainability and future growth. According to their responses, only half of the not-for-profit providers and half of the for-profit providers have a strategic plan, which is a document that outlines the vision, mission, goals, and strategies of the provider. Additionally, only 50 per cent of the not-for-profit providers and 75 per cent of the for-profit providers follow an annual work plan, which is a document that specifies the activities, tasks, and resources for the year. Polytechnic institutes, on the other hand, stated that they have and follow both a strategic plan and an annual work plan, in addition to having a separate HR department, a separate accounts department, and performing internal and external financial audits.

5.9.18. Future plans and sustainability mechanisms of TVET providers

TVET providers offering manufacturing courses mostly rely on conventional methods of providing services. However, they should adopt digitization in enrolling students, such as online registration, and follow international standards in delivering training to improve the skills of trainees, with the aim of increasing remittance through overseas employment.

TVET providers also want to offer more RPL courses for different trades in the manufacturing sector and to certify a large number of students so as to support the growth of the sector by supplying more workers to meet local demand. To achieve these goals, TVET providers need financial support from the Government and from NGOs to enhance their capacities and sustain their long-term growth. Moreover,

TVET providers may consider shifting from donor funding-based course offerings to fee-based course offerings, to generate more revenue and to reduce their dependence on external sources.

It was seen among the TVET providers in Cox's Bazar that they have a tendency to pursue funds from donors, as they perceive this as a sustainable way of continuing TVET programmes. Moreover, during FGDs with trainees and graduates, it was discovered that they are also accustomed to participating in donor-funded courses, as they are free of cost. However, the opposite perspective was also observed, with a few FGD participants stating that they would be more interested in fee-based courses if those courses are of high quality, operate at an advanced level and meet industry demand.

▶ 5.10. Sector-specific key supply side systemic constraints and challenges

5.10.1. Relevance of curricula and qualifications

In the fast-changing world of manufacturing, there's a common story in TVET – outdated curricula struggling to keep up with industry needs. This leads to a shortage of skilled workers for the manufacturing sector. Insights from discussions undertaken during the study highlight the urgent need to align education with industry demands. Current curricula lack the right mix of practical skills needed in the job market, leaving students facing challenges when entering the workforce. Curricula on AI technologies have started to become a necessity. A well-designed curriculum, especially for visually impaired individuals and others living with disabilities, becomes a beacon of hope, fighting poverty and promoting inclusivity. Collaboration among industry, government, training providers and students is important to create a relevant and effective curriculum.

5.10.2. Delivery and assessment practices

The challenges inherent in delivery and assessment practices encompass various facets:

Inappropriate teaching methods

The utilization of teaching methods that may not align with the dynamic learning needs of trainees potentially hinders effective knowledge transfer.

Lack of methodology training for trainers and instructors

Insufficient training for trainers and instructors in contemporary methodologies is impeding their ability to adapt to evolving educational landscapes.

Limited opportunity for apprenticeships

The scarcity of avenues for apprenticeships deprives trainees of crucial hands-on experience and hinders the practical application of their acquired knowledge.

Lack of monitoring from the BTEB on assessment practices

The absence of effective oversight from the BTEB concerning assessment practices potentially leads to inconsistencies and inadequacies in evaluating trainee performance. Addressing these challenges is integral to enhancing the overall quality and efficacy of TVET courses in manufacturing-related areas.

A comprehensive approach that includes ongoing training for instructors, a concerted effort to expand apprenticeship opportunities, and heightened monitoring mechanisms from regulatory bodies is recommended to ensure the continuous improvement of both delivery and assessment in the TVET sector.

5.10.3. TVET providers' linkages and support for work-based learning

The manufacturing sector in the Chattogram–Cox's Bazar region is grappling with a formidable challenge stemming from the absence of effective and formalized connections between TVET providers and industry. This critical deficiency not only limits the avenues for students to acquire practical, on-the-job experience, but also obstructs their prospects of finding suitable employment upon completing their training.

Importantly, this challenge is not confined to a specific locale; it permeates the TVET landscape in both Chattogram and Cox's Bazar. In Cox's Bazar the manufacturing industry is nowhere near as developed as it is in Chattogram, and as a result, industry and TVET provider linkages struggle to be formed.

▶ 5.11. Skills gap analysis

The manufacturing sector comprises a number of large subsectors such as light engineering, consumer electronics, furniture and so on. As such, it is difficult to attribute a particular occupation to the wider manufacturing sector. However, there are some common occupations that can be found across different manufacturing subsectors. From the ESS, a number of these major common occupations were identified, along with the skills training needed for these occupations. On the other side of the equation, the skills supply assessment identified the supply of skills programmes related to identified occupations. The information was then later validated by sector experts and government regulatory officials during KIIs. Based on the information gathered from the primary surveys and the KII validations, a training gap analysis was constructed for the manufacturing sector. Table 27 below shows the major occupations and skills training needed for these occupations, as well the degree to which these trainings are available in the Chattogram–Cox's Bazar region. The availability frequency was derived from the frequency with which a specific course/training was reported by TVET providers and how related the skill training is to the occupation in question.

▶Table 28. Training gap analysis for priority occupations in the manufacturing sector

Major occupations	Skills training needed from TVET providers	Availability of training	Remarks
Machine Operator	▶ CNC machine operation ▶ Lathe machine operation ▶ Grinding machine operation	Not available	There are courses, such as sewing machine operation, that can be attributed in various sectors, but not directly in the manufacturing sector
Mechanical/ Repair Technician	▶ Electrical works ▶ Repairing of electrical and mechanical goods	Inadequately available	
Welder	▶ Welding	Not available	
Packaging Technician	▶ Packaging and labeling	Not available	
Quality Controller	▶ Electronics technology, Mechanical technology ▶ Food technology	Inadequately available	In diploma-level courses there is a quality control skill component included, but there is no specific course only for quality control.
Electrical Technician	▶ Electrical and electronics	Adequately available	
Assembler	▶ Assembling spare parts of machines	Not available	
Junior Mechanic	▶ Helping technicians	Adequately available	
Consumer Electronics Technician	▶ Electronics workshop and maintenance ▶ Electronic works	Adequately available	
Sales and Marketing Executive	▶ Product promotion and marketing	Inadequately available	
Marine Engine Technician	▶ Marine engine repair and servicing	Inadequately available	

As can be seen in the table above, for most of the in-demand occupations in manufacturing sector, skills training is either not available or inadequately available in the Chattogram–Cox's Bazaar region.

▶ 5.12. Recommendations

Specific occupational skills

- Machine Operators need skills in the operation, maintenance and basic repair of the machinery they are responsible for. These are very technical skills that require practical training to adequately equip the individuals concerned.
- Quality Controllers need keen observation skills, knowledge of quality standards and regulations, proficiency in using measuring instruments, and data recording and analysis for quality assessment. Managers and Supervisors need leadership skills, project management skills, sectoral understanding, value chain understanding, communication skills, knowledge of manufacturing processes and procedures. Many of the stated skills are subsector-specific and need different approaches to provide the appropriate skills. Therefore, subsector-specific training and education programmes need to be offered.
- Enhance the capacity of existing trainers through comprehensive Training of Trainers programmes and pedagogy training. This will ensure that trainers are equipped with the latest teaching methodologies and subject matter expertise.
- Advocate for the BTEB to expand course offerings by introducing advanced-level courses, specifically at NSC levels 3 and 4, to build on the foundational basic courses. This progression will allow for a more in-depth and specialized skill development curriculum.
- Large TVET providers, such as polytechnics, can initiate partnerships with prominent enterprises, affiliating them with training programmes. This kind of collaboration will help ensure hands-on, market-driven training aligned with industry needs. The involvement of enterprises enhances the practical relevance of training, fostering better employability.
- Expand training programmes in CNC (Computer Numerical Control) machine operation, lathe machine operation, and grinding machine operation. This expansion caters to significant employment opportunities in the light engineering sector and the shipbuilding sector in Chattogram, aligning training with the demands of these specific industries.

Core work skills

- People management and multitasking skills are necessary for those in leading positions in the manufacturing sector. This requires overall sector knowledge, market awareness and other soft-skills in this sector. Sector-specific formal short courses related to soft skills can be introduced to address this skills gap.
- Provide specialized training for mid-level managers to enhance their skills in conducting effective training needs assessments for their workforce.
- Conduct training sessions for supervisors and managers to enhance their understanding of OHS standards and practices. This training is essential for maintaining a safe working environment and preventing workplace accidents. In addition, there is a need to sensitize operational-level workers to the importance of using personal protective equipment (PPE) and adhering to safety measures.

Collaboration between employers and training providers

- Establishing workplace-based learning modules for various subsectors – including light engineering, shipbuilding and leather goods – involves designing training programmes that integrate hands-on experience directly within the workplace. The goal is to align training with the specific needs and practices of each industry.

- Invite industry professionals to conduct guest lectures and workshops within the TVET providers. This exposure provides students with insights into the latest trends, technologies and best practices in the manufacturing sector, offering a bridge between academic theory and practical industry applications.
- ISCs should be actively working at the regional level to ensure collaboration between regional employers and TVET providers.

Access to skills development, social inclusivity and lifelong learning

- Develop and maintain infrastructural facilities that cater to the needs of all individuals, ensuring inclusivity for vulnerable communities, youth, women and persons with disabilities. This may include the installation of ramps, railings and other assistive equipment to facilitate accessibility.
- Introduce RPL mechanisms tailored to priority occupations. This will ensure that workers at different skill levels can engage in continuous learning and certification processes, acknowledging their existing skills and experiences within specific occupations.

Wider systemic changes

- Identify skills relevant to green business practices. This includes recognizing the specific skills required for sustainable manufacturing, environmental conservation and waste management.
- Integrate green business and sustainable practices, such as waste management and recycling, into existing curricula. Modify training programmes to incorporate the identified green jobs, ensuring that individuals undergoing technical and vocational education are equipped with knowledge and expertise in environmentally conscious practices.

6

Agri-food processing sector

Chapter 6. Agri-food processing sector

▶ 6.1. Introduction

The agri-food processing sector is one of the most important and diverse sectors in Bangladesh, contributing to the food security, nutrition, and the incomes and employment. The sector – hereafter referred to as the "agri-food sector" –includes the production, processing, marketing, and consumption of various agricultural products, such as crops, livestock, fisheries and forestry (United States, ITA, n.d.).

The Chattogram region holds a special position in agri-food, in part because of its dynamic role in facilitating the trade and transportation of agri-food products. In addition, many areas of the Chattogram region have favourable climate, soil and water resources for the cultivation of various crops, such as rice, wheat, maize, pulses, oilseeds, fruits, vegetables, spices and flowers. For example, jhoom cultivation has been gradually expanding in the Chattogram Hill Tracts districts. On the other hand, Cox's Bazar caters to a rich and diverse livestock and fisheries industries, with a large number of cattle, poultry, goats, sheep, and fish farms. In short, the Chattogram–Cox's Bazar region has a vibrant and growing agri-processing industry, which produces and exports various food and beverage products, such as dairy, meat, fish, baked goods, confectioneries, juices and snacks (Bangladesh, BIDA, n.d.-b; FAO, n.d.).

However, the agri-food sector in the Chattogram–Cox's Bazar region also faces several challenges and constraints that limit its productivity, competitiveness and sustainability. One of the major challenges is skills gaps, which can be caused by various factors, such as lack of quality education and training, inadequate infrastructure and facilities, insufficient information and awareness, low wages and incentives, and rapid changes in technology and the market (FAO 2021).

▶ 6.2. Profile and situation analysis for the agri-food sector

6.2.1. Economic profile

Growth in the agri-food sector in Bangladesh is indicating a positive trend in terms of industry development and an increased demand for labour can also be anticipated, which can potentially contribute to employment generation. In 2019–20, Bangladesh had an agricultural output of 70 million metric tons and the agricultural sector as a whole employed 40.6 per cent of the labour force and contributed 14.23 per cent to GDP. By comparison, the agri-food processing industry contributes 1.7 per cent to GDP and employs 250,000 people. Its share of total exports is approximately 3.5 per cent (Bangladesh, BIDA, n.d.-b). This is a very little increase from the statistics of 2004-05 (Innovision 2015), and suggests that there is significant room for improvement in the sector.

Bangladesh exports over 700 agri-food items, including 63 basic agri-processed products such as cereal grains, frozen fish, processed meat, tea, vegetables, and more to 140 countries. The country has 486 agri-processing manufacturers, with 241 being exporters and 235 serving the domestic market (Bangladesh, BIDA, n.d.-b). In FY 2018–19, the agri-food sector generated export earnings of US$1.41 billion, primarily from frozen fish, shrimp, tea, spices, fruits, and other processed agricultural products.

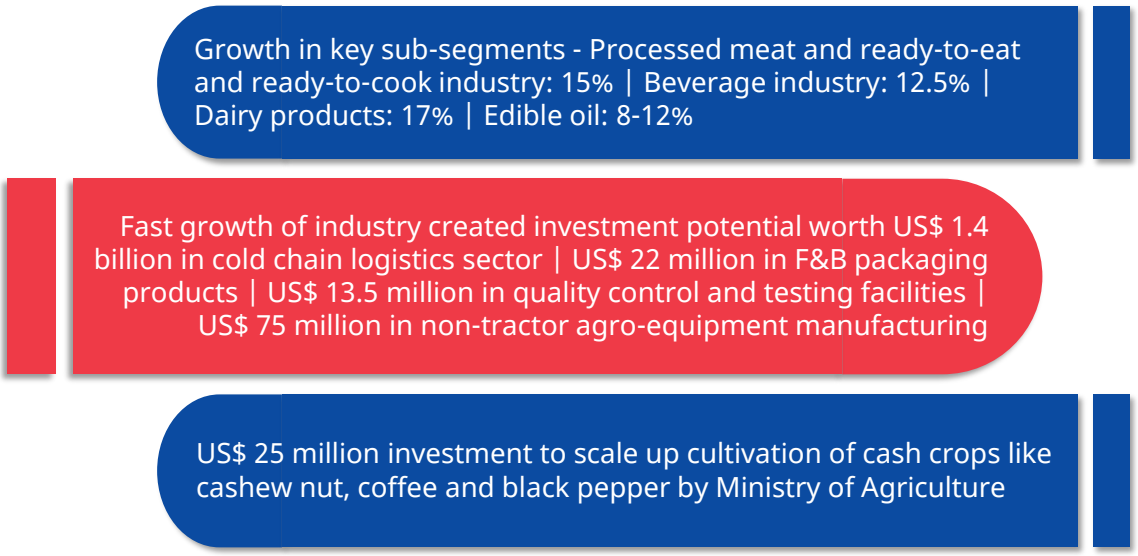
In the domestic market, the packaged food industry was worth US$5.2 billion in 2018, and it is projected to reach US$7.3 billion by 2023. Notably, edible oils, dairy products, and snacks are leading in terms of

sales value, with a steady growth rate of approximately 6 per cent per year until 2023. Processed fruits, vegetables, seafood and meat are expected to see rapid expansion, with growth rates of 8 per cent, 13 per cent, and 13 per cent per year, respectively.

6.2.2. Workforce profile

The agri-food sector is not a formally classified as one of the main sectors of the economy, but instead falls under the manufacturing sector, and it is therefore difficult to secure proper, authoritative data on the workforce profile at the moment. However, looking at the market size of agri-business and the growing market of readymade food in the country, a promising employment outlook in the agri-food sector can be expected in future. Exporting more than 700 items from the agribusiness sector, the agri-food subsector contributes 9 per cent to the total exports from the agribusiness sector. However, a considerable portion of the demand for the products of the agri-food subsector comes from the sizeable Bangladeshi diaspora, who like to consume cereal grains, frozen fish, processed meat, tea, vegetables, fruits, spices and dried foods from their home country. This market has great potential to be expanded to non-Bangladeshi consumers, which would generate more productive earnings for the subsector.

▶Figure 130. Sectoral growth in the agri-food subsectorsectorsectorhospitality sector (% of respondents, N=126)



Source: Agribusiness Sector Profile E Version (2021)

Some of the products of the agri-food sector have been experiencing notable growth in Bangladesh. As shown in the figure above, the processed meat, ready-to-eat and ready-to-cook industry has seen 15 per cent growth, along with the beverage industry at 12.5 per cent, dairy products at 17 per cent, and edible oils at 8–12 per cent. One of the obstacles for perishable agri-food products is the lack of cold chain logistic facilities. The cold chain sector can be a fast-growing industry, with potential investment of US$1.4 billion. Another limitation in regard to producing exportable agri-food products and expanding the market beyond the Bangladeshi diaspora is that the packaging industry in Bangladesh has not been developed yet. Considering the potential of this packaging industry, about US$22 million in food and beverage packaging products can potentially be produced in Bangladesh. In addition, US$13.5 million in potential investment can be made in quality control and testing facilities.

6.2.3. Value chain analysis

To provide an in-depth discussion of the agri-food processing sector in Bangladesh, with particular focus on the value chain and elaborating on the context of the Chattogram–Cox's Bazar region, we need to consider multiple aspects that influence the sector, including domestic capabilities, market dynamics, government policies, quality control, and the recommendations for overcoming potential challenges in these areas.

Bangladesh's agri-food sector benefits from a high value addition thanks to the domestic availability of raw materials. With a market growing at an average rate of 7.7 per cent between 2005 and 2017, and a domestic market size of US$2.8 billion in 2019, the sector shows promising expansion, driven by an increasing middle-class population and urbanization trends. The growth is particularly noted in sectors such as dairy, with an annual growth rate of 17 per cent, and meat consumption, which is increasing by 15 per cent annually (Bangladesh, BIDA, n.d.-b) .

The Government has provided various incentives, including tax holidays, special rebates on electricity consumption, and tax exemption on income from rice bran oil production, with the aim of boosting agri-food production capacity and to encourage local processing. Exporters benefit from 50 per cent tax exemptions on income derived from exports and a 20 per cent export subsidy for locally processed agricultural products (Bangladesh, BIDA, n.d.-b) .

Organizations such as the Bangladesh Food Safety Authority (BFSA) and the Bangladesh Standards and Testing Institution (BSTI) ensure the safety and quality of agri-food products. These organizations play a crucial role in maintaining standards and providing certifications, which are essential for both local markets and international exports.

Challenges include market access barriers, high transport costs, inadequate electricity supply, and lack of cold storage and processing facilities. Additionally, there is a shortage of skilled workers in packaging and temperature control, and the sector encounters problems from cultivation to packaging, including the use of excessive pesticides and lack of post-harvesting techniques (Raihan 2022).

To realize the sector's full potential, it is recommended to enhance exporters' capacity to meet international standards, manage transport conditions, improve electricity access, set up cold storage facilities, provide better financial services, and improve the capacity of the BSTI and related agencies.

Role of agri-food processing in economic transformation

The agri-food sector holds the potential for significant economic transformation in Bangladesh, by creating employment, particularly for women, and developing forward and backward linkage industries. However, despite its growth, the sector's contribution to GDP and the total workforce remains relatively low, with exports under US$500 million. Nonetheless, the sector enjoys a competitive advantage in shrimp exports and has the potential to expand in other areas (Raihan 2022) .

For regions like Chattogram and Cox's Bazar, the focus should be on enhancing the value chain in seafood processing, improving infrastructure for logistics and electricity, and developing direct links between farmers and processors to minimize costs and improve efficiency. These regions have unique advantages due to their geographical location, and they should leverage these for regional economic growth.

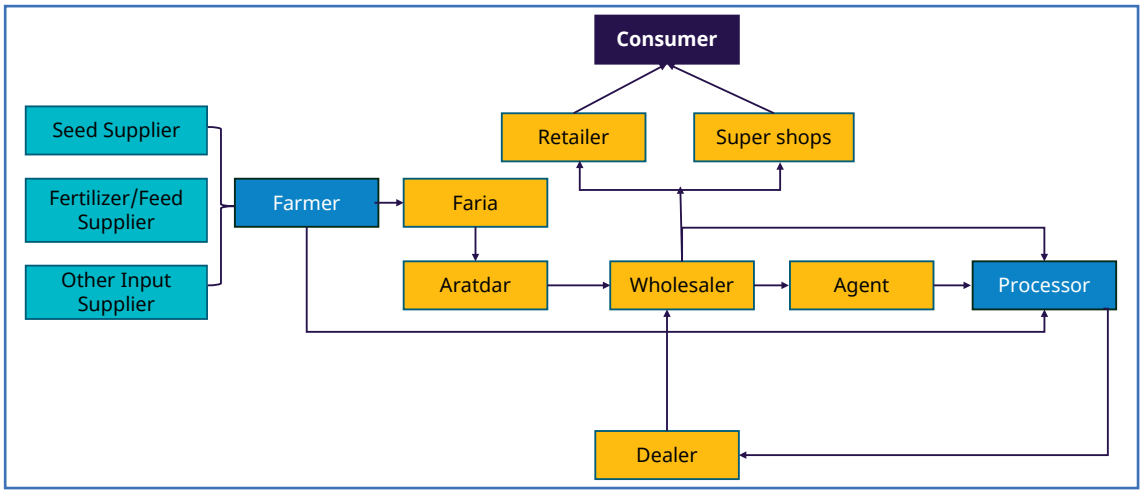
The value chain

The value chain of the agri-food processing sector in the Chattogram–Cox's Bazar region has been primarily derived based on the basic agri-food value chain in Bangladesh, which has the following key components: input supply, production, processing, and distribution and marketing (World Bank, 2020). In the regional context, the agri-food processing value chain is a multifaceted and complex system that involves various actors, including input suppliers, primary producers, and produce traders, each facing

unique challenges that impact the overall efficiency and productivity of the sector. Figure 133 outlines the journey of agricultural products from the initial input suppliers to the end consumer. The following is a step-by-step accounting of the agri-food value chain:

- **Input supply stage:** Input suppliers provide essential materials such as seeds, fertilizers and pesticides. Challenges for input suppliers include an informal market dominating seed supply, making it hard to ascertain the quantity of the seeds produced. There is also a large counterfeit seed market, high import dependency for fertilizers, and a lack of proper training on efficient fertilizer use (LightCastle 2019).
    - Seed suppliers provide seeds for the crops. Challenges include a significant presence of counterfeit seeds and a general lack of training on efficient fertilizer use, impacting productivity and sustainability (Innovision 2016).
    - Fertilizer/feed suppliers provide fertilizer for crops or feed for livestock.
    - Other input suppliers provide other necessary inputs, which could include equipment, pesticides and so on.
- **Production stage:** Primary producers, or farmers, face issues such as unmechanized cultivation practices, the impacts of climate change on different regional farming areas, inefficient production planning leading to reduced produce prices, and limited power in price negotiations.

▶Figure 131. Value chain for agri-food processing sector



- **1. Distribution and intermediary stage:** Once the products are ready, they pass through several intermediaries before reaching the consumer:
    - ***Farias,*** as mobile traders, purchase from farmers to sell to aratdars, often buying in bulk to sell at a premium later. They also conduct basic processing like sorting and drying.
    - ***Aratdars,*** which are traders with market stalls or other physical infrastructure, acquire crops from farias and sell to agents as per processors' schedules, deciding on their ability to meet quantity and price demands.
    - **Wholesalers** buys large quantities of products from various farias/aratdars and sell them to retailers or other buyers.

- **Agents** act as a middleman who might specialize in connecting sellers with processors or other buyers. They are employed by large agri-food processors to procure the bulk of the necessary ingredients for processing.
- **Dealers** are another form of intermediary who might operate at different levels of the distribution chain, potentially selling to wholesalers, retailers, or even directly to large consumers.

- **2. Processing stage:** The **processor** is involved in converting raw agricultural products into forms suitable for consumption or retail sale. This can include cleaning, packaging, canning, freezing or any other form of food processing.
- **3. Retail stage:** The processed products then move to:
  - **Retailers:** The entities that sell directly to the final consumer. These can include grocery stores, markets and other outlets.
  - **Super shops:** Larger retail outlets or supermarket chains that usually buy in larger quantities and offer a wide variety of products.
- **4. Consumption stage:** Finally, the value chain ends at the **consumer,** who purchases and consumes the product.

The arrows in figure 133 above indicate the flow of goods through the value chain. The split between the *faria/aratdar* route and the processor route suggests that not all produce goes through processing; some is sold directly through markets or retail outlets. The presence of multiple intermediary stages indicates a complex distribution network, which could involve various levels of buying, selling and value addition before the products reach the consumer.

6.2.4. Institutional mapping for agri-food processing sector

There are various institutions and organizations that provide services to the agri-food sector directly and indirectly. These institutions include government organizations and agencies, private sector stakeholders, as well as NGOs and INGOs. This sections presents some of the major stakeholders in the agri-food sector; for a more complete list of stakeholders, see annex table 7.

The **Bangladesh Small and Cottage Industries Corporation (BSCIC)** plays a vital role in supporting and promoting small and cottage industries that are engaged in agri-food processing. This support is essential for fostering the growth and development of smaller-scale agri-food businesses, contributing to economic sustainability and employment opportunities.

State-owned and private commercial banks provide crucial financial services and credit facilities to agri-food businesses. These services help agri-food enterprises access capital for expansion, investment, and day-to-day operations, thus enabling their growth within the sector.

Microfinance institutions offer microfinance and financial support to small-scale agri-food enterprises. This support is instrumental in providing financial access to micro-entrepreneurs, helping them establish and sustain their agri-food businesses.

The **Export Promotion Bureau (EPB)** takes on the role of promoting and facilitating the export of agri-food products to international markets. In doing so, the EPB aids agri-food producers in expanding their market reach and increasing their exports, which can be vital for economic growth.

The **Department of Agricultural Extension (DAE)** plays a pivotal role in providing agricultural knowledge and support to agri-food producers and farmers. Its efforts contribute to improving agricultural practices, enhancing productivity and ensuring food security in the country.

The **Bangladesh Agricultural Research Institute (BARI)** conducts research aimed at improving agri-food production and enhancing product quality. Research outcomes from BARI contribute to technological advancements and increased agricultural productivity within the sector.

The **Bangladesh Standards and Testing Institution (BSTI)** sets standards and ensures quality control for agri-food products. This role is crucial in guaranteeing consumer safety and maintaining product quality standards in the agri-food sector.

These key stakeholders collectively contribute to the growth, development and sustainability of the agri-food processing sector in Bangladesh. Their roles encompass support for small and cottage industries, access to capital, export promotion, gender empowerment, agricultural knowledge dissemination, research and innovation, quality control, and policy advocacy, all of which are essential for the sector's success and economic impact.

6.2.5. Analysis of business environment: SWOT and drivers of change

This section presents a SWOT analysis for the regional agri-food sector, which reveals a complex landscape encompassing both internal strengths and weaknesses, as well as external opportunities and threats.

- **Strengths**
  One of the sector's notable strengths lies in the wealth of local expertise, with many workers possessing a deep understanding of traditional farming and harvesting techniques. This knowledge can be harnessed for sustainable and efficient production. Moreover, the sector excels in inclusive employment, actively involving a diverse workforce that includes men, women, youth and marginalized groups. This inclusivity not only reduces social disparities, but also bolsters the labour force. Additionally, the sector's openness to self-employment and entrepreneurship with relatively low capital requirements encourages economic empowerment and employment generation, particularly in rural areas. Furthermore, the foundation of traditional knowledge in agriculture provides a solid base upon which modern practices can be built, enabling adaptation and growth.

- **Weaknesses**
  However, the sector also grapples with certain challenges. A significant portion of the workforce lacks formal education, limiting their ability to adopt modern technologies and hindering innovation. The limited availability of skills training in modern agricultural technologies and machinery operation results in inefficiencies and productivity constraints. Communication skills, often overlooked, can curtail the sector's capacity to market products effectively and engage with external stakeholders and markets. Additionally, there's a shortage of skilled labour capable of operating digital machinery and adopting new farming techniques, which is critical for the sector's modernization.

- **Opportunities**
  There are significant opportunities for the agri-food sector. Embracing modern agricultural technologies and machinery can enhance productivity, reduce reliance on manual labour, and lead to more sustainable practices. Market expansion, particularly into export opportunities, offers the potential for economic growth and reduced dependence on domestic markets. Investment in skills development by government and NGOs can help bridge the skills gap, fostering innovation and growth. Furthermore, the transition to hybrid and more efficient agricultural practices aligns with global food demand and presents new opportunities for increased production.

- **Threats**
  Despite these opportunities, the sector is not without its threats. The advent of the Fourth Industrial Revolution, marked by increased automation and technology adoption, may lead to job displacement, particularly in roles that can be automated. This poses a risk to the livelihoods of traditional agri-

food workers. Moreover, unforeseen events such as the COVID-19 pandemic can create financial challenges for both entrepreneurs and workers, impacting their ability to invest and sustain operations. In areas with restricted access to modern technology and machinery, development may be hindered, making it vital to bridge this technology gap. Land leasing practices that prioritize monetary gain over genuine farming can affect the availability of agricultural land, potentially

In conclusion, the agri-food sector in Bangladesh is at a crucial juncture – with potential for growth and modernization. To capitalize on opportunities and address threats, the sector must focus on technology adoption, skills development and market expansion. Additionally, recognizing and mitigating the challenges associated with automation, financial instability, and land access is essential for the sector's long-term sustainability and competitiveness in the ever-evolving global agri-food landscape.

▶ 6.3. Profile of major occupations

This section offers valuable insights into the various occupations within the agri-food processing sector. While this section presents a short list of major occupations, annex table 12 provides a more detailed list that includes information on required skills and the priority level of each occupation within the agri-food sector. The priority level for each occupation was determined based on how frequently a particular occupation was cited in secondary research, FGDs, and KIIs – and was validated through STED Workshop.

List of key occupations in agri-food processing sector

- Baker
- Food Processor and Quality Controller
- Food Packaging Technician
- Food Safety and Hygiene Specialist
- Poultry and Meat Processing Specialist
- Refrigeration and Cooling System Operator
- Food Grain Machine Operation Technician
- Food Preparation Specialist
- Automatic Baking Operation Technician
- Fisherman
- Farmer
- Seed Merchandiser
- Pesticide Technician
- Quality Control and Assurance
- Food Preservation Techniques
- Food Processing Machinery Operation
- Fruit and Vegetable Processing
- Grain and Cereal Processing
- Meat and Poultry Processing
- Fish and Seafood Processing
- Dairy Processing
- Food Ingredient Knowledge

- Product Development
- Waste Management
- Regulatory Compliance
- Supply Chain Management
- Environmental Sustainability
- Cost Management
- Entrepreneurship Skills

The wide range of occupations found on this list comes with a correspondingly wide range of necessary skills. For example, a Baker needs to possess skills such as baking, understanding recipes, food safety, creativity, and attention to detail. These skills are essential for producing high-quality baked goods, emphasizing the importance of craftsmanship in food production. By contrast, the role of a Food Processor and Quality Controller demands expertise in food processing techniques, quality assurance protocols, and food safety regulations. This underscores the critical role of quality control in ensuring the safety and consistency of food products, especially in large-scale processing facilities.

As noted above, priority levels have been assigned to each occupation, which provides insights into their relative importance within the industry. Occupations labeled with a priority level of "1" (again, see annex table 12) are likely considered foundational, as they are essential for ensuring food safety and hygiene. These roles, such as the Food Safety and Hygiene Specialist or Poultry and Meat Processing Specialist, play crucial roles in maintaining the industry's integrity and ensuring consumer well-being.

6.3.1. Demand for skilled workers in the agri-food sector

The agri-food sector in Bangladesh is expected to see a substantial surge in demand for skilled workers. According to a study conducted by Bangladesh Institute of Development Studies in 2016, the agri-food sector is projected to see a 261 per cent increase in skilled workforce demand, which is second-highest projected rate among all sectors in the country. This projected percentage increase implies that the sector is likely to require a significantly larger workforce with specialized skills in various aspects of food production, processing and distribution. The projected increase in demand in the sector may be attributed to various factors, including the growing population, changing dietary preferences, increased exports, and a need for more advanced technologies and techniques in agriculture and food processing. Skilled workers in this sector might include Agricultural Specialists, Food Technologists, Supply Chain Experts, Food Safety Inspectors, and others with expertise in various aspects of the agri-food industry. This level of demand suggests that there will likely be opportunities for jobseekers and professionals to find employment and contribute to the growth and development of the agri-food sector in Bangladesh.

Similarly, participants in the FGDs and KIIs of this study also indicated that there is a growing demand for skilled workers in the agri-food sector. The FGD sessions in Chattogram indicated that the sector has consistent demand for skilled workers, with an emphasis on the ability to manage farms and carry out specialized tasks, such as cultivation and production. Even so, both of the FGDs in Chattogram indicated that there was also a growing need for skills related to modern agricultural practices and within the business side of the sector. The FGD in Rangamati foresaw future requirements for technology-based skills, while FGDs in Khagrachari and Cox's Bazar highlighted an anticipated increase in demand for skilled production, as well as existing training deficits. By contrast, another FGD in Cox's Bazar noted that in certain sectors, such as salt farming, the demand was not for skilled labour but rather for basic labour ability. While some participants feel that traditional methods do not require skilled labour, there is an acknowledgment that technology will play a bigger role in the future, thus increasing the need for skilled personnel. There is also an indication that more educated individuals could find success in the sector as it modernizes.

6.3.2. Skills required for agri-food sector

FGD and KII participants emphasized that success in the agri-food sector relies on a deep understanding of cultivation, food production and marketing. Participants emphasized the importance of agricultural knowledge when it comes to comprehending various business and technical affairs within the sector, which in the end helps in the development of effective strategies for risk mitigation, adaptation, efficient management, cost minimization and understanding the market.

As the sector is closely related to the agricultural sector as a whole, FGD and KII participants mostly identified in-demand skills such as seedling planting, maintenance, food processing, marketing, and technology usage. Specifically, the following agri-food sector-specific skills were mentioned by study participants:

- **Food safety and hygiene:** Understanding and implementing food safety practices and hygiene standards is crucial to prevent contamination and to ensure the safety of processed food products.
- **Quality control and assurance:** Skills in quality control – including assessing the quality of raw materials, intermediate products, and finished goods – are essential to maintain consistency and meet regulatory standards.
- **Food preservation techniques:** Knowledge of various food preservation methods such as canning, freezing, drying, and salting is vital to extending the shelf life of perishable agricultural products.
- **Food packaging:** Proficiency in selecting appropriate packaging materials, sealing techniques, and labeling is necessary to maintain product quality and to facilitate marketing. The emerging trends and technologies in the food packaging industry will create the need for new skills in this subsector, according to KII participants.
- **Food processing machinery operation:** Understanding how to operate and maintain food processing equipment and machinery, such as grinders, blenders, slicers and extruders, is crucial for efficient processing.
- **Fruit and vegetable processing:** Expertise in processing fruits and vegetables, including peeling, cutting, juicing and pureeing, to create products such as jams, juices and sauces.
- **Grain and cereal processing:** Skills in milling, grinding and baking are important for processing foods into final products such as flour, bread and snacks.
- **Meat and poultry processing:** Knowledge of meat cutting, deboning, marinating and packaging is necessary for producing meat products. The KII session with a member of an agri-food association indicated that the livestock subsector does not have the opportunity to produce for export. This suggests that the subsector primarily caters to the local market and operates at a medium level in terms of market reach and influence. This local focus could imply that the subsector's workforce and practices may not be as advanced as those in other agri-food subsectors with a stronger export orientation. Therefore, skills in maintaining export standards may be valuable for the livestock subsector as a means to opening new markets.
- **Fish and seafood processing:** Proficiency in filleting, cleaning, smoking and canning fish and seafood products.
- **Dairy processing:** Skills in pasteurization, cheese making, yogurt production and milk processing are essential for dairy products.
- **Food ingredient knowledge:** Understanding the use of various ingredients such as spices, flavours and preservatives in food processing is important for enhancing taste and extending shelf life.
- **Product development:** Creativity and knowledge to develop new food products and recipes that cater to changing consumer preferences and market trends.

- **Waste management:** Skills for managing by-products and waste generated during food processing, including disposal and recycling methods.
- **Regulatory compliance:** Familiarity with food safety regulations, labeling requirements, and licensing procedures to ensure compliance with local and international standards.
- **Supply chain management:** Skills to manage the supply chain efficiently, including sourcing raw materials, production, distribution and logistics.
- **Environmental sustainability:** Knowledge of sustainable food processing practices that minimize environmental impact and waste generation.
- **Cost management:** Understanding cost-effective processing methods and minimizing wastage to ensure profitability.
- **Entrepreneurship skills:** For those interested in starting food processing businesses, skills in business planning, marketing and financial management are crucial.

6.3.3. New skills in demand

Based on the information collected from KIIs and FGDs, the new skills that are in demand in the agri-food sector are as follows:

- **Modern agricultural technologies:** The demand for skills related to modern agricultural technologies is on the rise. This includes proficiency in using digital tools and machinery for tasks such as precision farming, automated irrigation and data-driven decision-making. Farmers and agricultural workers need to adapt to and operate these advanced technologies to increase production levels and efficiency.
- **Digital literacy:** As the sector undergoes digitalization, there is a growing need for digital literacy skills. This involves the ability to use and navigate digital tools, software and applications relevant to agriculture, such as data analytics platforms and farm management software.
- **Hybrid agriculture:** With the shift from traditional agriculture to hybrid agriculture, workers are increasingly required to have knowledge of and skills in hybrid plant cultivation. This may involve the ability to manage and optimize hybrid crops for improved yield and resistance to pests and diseases.
- **Pesticide application:** Skill in safe and effective pesticide application are essential for maintaining the health and productivity of crops. Proper pesticide use and application techniques are crucial for pest and disease management in modern agriculture.
- **Food processing and storage:** In the context of agri-food, skills related to the proper storage and preservation of agricultural products, including fruits, are in demand. This includes knowledge of cold storage systems, freezing techniques and quality maintenance to extend the shelf life of products.
- **Fruit cutting and processing:** Skills in fruit cutting and processing are essential for transforming raw agricultural produce, such as fruits, into value-added products. Workers need to be trained in cutting techniques and processing methods to meet market demand for processed fruits.

Evolution of skills

The FGD and KII participants noted that the required skills have evolved over time due to changes in technology and farming practices, especially the integration of digital machinery, with this shift being particularly due to the relatively high availability of information technology and many young entrepreneurs showing interest in investing in the agri-business sector. The role of information being available on various online platforms has contributed to creating a general understanding of the demand for and potential of agri-food products, both nationally and internationally.

Technological skills

There's a need for specific technical skills, including knowledge of modern agricultural technologies and equipment operation. Training on digital machinery and online marketing is necessary for the sector's development as well. Depending on the specialization of the food processing business (fruits, vegetables, dairy, seafood and so on), in-depth technical knowledge in that specific area is necessary. To guarantee product quality and to maintain standards, skills in microbiological testing and quality control are extremely important to ensure that food products are free from harmful microorganisms and safe enough for the human food chain. The machines that processing and production enterprises depend on also need people with technical knowledge in mechanical and electrical systems for maintenance and troubleshooting purposes.

> "The demand for skills in modern agriculture and farming technique is high, but due to the unavailability of such skillful human resources, we do our respective work with less skilled workers.
>
> **– FGD participant (agri-food sector)** in Chattogram

FGD participants in Chattogram and Rangamati indicated that in the agri-business sector, farm owners often work on their own farms. This suggests a close relationship between ownership and labour, and it might be indicative of small-scale or family-owned farms, where owners are directly involved in farming activities. This direct involvement can save labour costs and ensure a more personal connection to the operation. However, the modern agriculture and farming techniques that will be needed when an agri-food business enters into industrial production suggest a growing need for workers who are skilled in applying modern agricultural production across the value chain, from farming on through to final processing. Modern agriculture often involves the use of advanced technologies, such as precision agriculture, drones and data analytics. This inevitable shift towards technology-based farming means that skilled workers with expertise in these areas will be in demand in order to operate and maintain the technology effectively.

The FGD participants in Rangamati and Khagrachori stated that based on the current situation of the agri-food sector in the region, they can definitely be viewed as skilled workers. However, they recognized that the a whole new skill set distinct will be needed as the sector moves to a technology-based production norm. Therefore, their projection is that skill development and training for those engaged in farming will be not just important, but necessary in the future.

Soft skills

Selected soft skills were recognized as important, with some agri-food sector participants particularly pointing to communication skills as being essential for marketing and interacting with various stakeholders. In Chattogram, the FGD participants emphasized that soft skills are generally not crucial in the agri-food sector, with the exception of communication skills, which are particularly important for selling agricultural goods. In Rangamati and Khagrachori, FGD participants also added teamwork and problem-solving skills as being important. In Cox's Bazar, there was a more mixed perspective on the importance of soft skills in the agri-food sector. In one FGD session, it was highlighted that

strong team bonding and problem-solving abilities should be prioritized, while also acknowledging a need for improved communication skills. However, participants in the other FGD session suggested that communication skills are not crucial since workers in this sector do not need to communicate with outsiders. However, they did stress the importance of team bonding and problem-solving.

> Teamwork, communication skills and problem-solving skills are very important in the agri-food sector.
>
> **- Representatives from agri-business owner** in Cox's Bazar

In the KIIs, teamwork, communication skills and problem-solving skills were cited as being vital in the agri-food sector, though the responses indicate a diverse range of opinions on the significance of soft skills in the sector. This diversity may be influenced by the specific nature of agricultural activities in each district. Communication skills are consistently highlighted as important, particularly for selling agricultural products and interacting with government and private officials. However, while teamwork is valued across districts, there are differences in how it is perceived. While some FGD participants emphasized the importance of teamwork, others suggested that workers in the agri-food sector primarily work with close colleagues and not outsiders, which to them meant that collaboration was inherent rather than a skill that needed to be developed. Problem-solving skills were acknowledged as important in several instances, indicating that the ability to address challenges in the agri-food sector is viewed as crucial. Some KIIs mentioned that associations in their districts have not taken specific measures to foster the development of these soft skills, suggesting a potential area for improvement.

▶ 6.4. Vision for the future of the sector

The vision of the agri-food sector was developed through the participants of the STED Workshop at Cox's Bazar. The agri-food sector stakeholders present at the workshop drafted their vision to express their goals and alignment with national policies.

We envision transforming the agri-food sector of the Chattogram region and Cox's Bazar into a vibrant, resilient, and sustainable sector that contributes to the food security, nutrition, income and employment of the people. Our vision is aligned with the national policies for the agri-food sector in Bangladesh, such as the National Agriculture the National Food and Nutrition Security Policy Plan, and the Promoting Agri-Food Sector Transformation in Bangladesh: Policy and Investment Priorities. The sector is committed to working with the Government, the private sector, civil society, and the development partners. We aim to achieve this vision by:

- *Diversifying and commercializing our agricultural production, processing, and marketing, with a focus on high-value as well as organic and safe food.*
- *Adopting climate-smart and nutrition-sensitive technologies and practices, such as drought-tolerant and biofortified varieties, integrated pest management, good agricultural and aquaculture practices, and post-harvest management.*
- *Enhancing connectivity and competitiveness in domestic and international markets by improving infrastructure, logistics and quality standards, as well as by promoting unique and niche products.*

- *Strengthening human and institutional capacities by investing in skills development, research and innovation, extension and information services, and digitalization of the agri-food sector.*
- *Ensuring environmental and social sustainability, by restoring and conserving natural resources, such as forests, wetlands and coastal areas, as well as addressing the challenges and opportunities of the refugee crisis, gender equality, and youth empowerment.*

6.5. Gaps in the capabilities and skills needed to achieve the vision for the future

Based on the qualitative survey of this study, the following business capability gaps were identified by analysing the responses from the FGD and KIIs conducted for agri-food processing sector.

- **Education and training gaps:** In Chattogram, discussions with participants revealed a need for educated and trained individuals in the agricultural sector. Many educated people are reluctant to work on farms, indicating a gap in skilled workforce availability.
- **Technology and infrastructure:** Challenges in adopting modern agricultural technology and infrastructure were noted. This includes a lack of access to modern equipment and facilities, emphasizing the need for training and technology access.
- **Skilled workforce:** A shortage of skilled technicians and workers in food processing affects quality and safety. There is a need for various skills, but it is unclear if there are organized training programmes available.
- **Machinery and equipment gaps:** FGD participants highlighted the need for machinery skills, as well as the absence of support from NGOs or INGOs in providing machines.
- **Capacity utilization and seasonality:** Seasonal operations and low capacity utilization in processing factories hinder consistent production and employment. This leads to gaps in employment continuity and income stability.
- **Quality and safety standards:** Inadequate focus on quality and safety standards poses a capability gap. It is unclear if the sector is well equipped to consistently meet regulatory requirements and ensure healthy farming practices.

By analysing secondary documents, this study identifies various business capability gaps in the agri-food subsector (Bangladesh, MOC 2021; Raihan 2022).

- **Access to finance:** One of the major capability gaps is the lack of access to finance, especially for small and medium-sized enterprises (SMEs) and export-oriented firms. This gap hinders their ability to invest in modern technology, expand operations and improve overall competitiveness.
- **Supply chain linkages:** Weak linkages between producers and processors result in inefficiencies, irregular supply of raw materials and low-quality produce. Improved coordination and collaboration in the supply chain are essential for a robust agri-processing sector.
- **Institutional support:** The sector lacks sufficient institutional support for supply chain development. This gap affects the overall efficiency of the agri-processing industry.
- **Testing facilities:** The agri-processing sector lacks accredited laboratory testing facilities, which are crucial for ensuring the quality and safety of processed food products.
- **Product development and innovation:** The sector lacks emphasis on product development and innovation. This is a critical gap, particularly for adapting to changing consumer preferences and expanding product offerings.

- **Involvement of women entrepreneurs:** The agri-processing sector has not made any significant efforts to engage women in export-oriented business. Gender inclusivity and empowerment are essential for promoting diversity and growth in the industry.
- **Compliance with regulatory requirements:** The agri-processing sector faces challenges in complying with stringent food safety norms, standards and regulations. This includes non-tariff measures (NTMs) and procedural obstacles, which can lead to delays and increased costs.
- **Infrastructure for cool chain and preservation:** Inadequate infrastructure for cool chain and preservation facilities hampers the ability to extend the shelf life of processed products, particularly for perishable agricultural goods.
- **Waste management and environmental practices:** Improper waste management is another capability gap, which can have environmental and regulatory implications.

Addressing these business capability gaps in the agri-food sector is essential for promoting growth, increasing competitiveness, and ensuring the long-term sustainability of the industry in Bangladesh. This may involve investments in technology, infrastructure, training, access to finance, and regulatory compliance, among other areas.

▶ 6.6. Skills supply findings

6.6.1. Supply of skills

One of the major objectives of the study was to determine the availability of skills programmes and training in Chattogram region and Cox's Bazar for the agri-food sector. Table 28 below shows the key skills training available related to the agri-food sector by certification level in Chattogram and Cox's Bazar.

▶ Table 29. Available agri-food sector-related TVET programmes in the Chattogram region and Cox's Bazar, by certification level

Programme level	Trade/specialization programmes available	
	Chattogram region	Cox's Bazar
Diploma	Diploma in Agriculture	Refrigeration and Air-Conditioning Technology
HSC (Voc)	Refrigeration and Air Conditioning	Automotive
SSC (Voc)	Agri-based Food Food Processing and Preservation Refrigeration and Air Conditioning	Food Processing and Preservation
NSC (Levels 1–5)	Agricultural Livestock Food Processing Refrigeration and Air Conditioning	
Informal certificate courses	Bakery and Pastry Fish and Seafood Fisheries Food Delivery Homestead Gardening and Nut Cultivation Livestock Rearing Packaging Refrigeration and Air Conditioning Food Delivery Packaging	Crabs Cultivation Dry Fish Processing Fish Cultivation Livestock Rearing Oyster Cultivation Poultry Rearing Salt Cultivation Seaweed Cultivation Seaweed Food and Beverage Vegetable Cultivation Refrigeration and Air Conditioning

Overall, there are not all that many formal courses or trainings available for the agri-food sector. At the diploma level, there is a specialized institution – the Agriculture Training Institute, which provides diploma courses in agriculture and agri-food-related specializations. The are two Agriculture Training Institute branches in Chattogram region, one in Chattogram and one in Rangamati. Though there is no specialized agricultural institution available in Cox's Bazar, one government polytechnic offers an agri-food-related course, which is Refrigeration and Air-Conditioning Technology. No HSC (Voc) and NSC level courses are available in Cox's Bazar related to this sector, but some informal training programmes are available in both the Chattogram region and Cox's Bazar. Most of these are delivered by government-run institutions and are mainly for grassroots-level people, such as farmers and fishers. It should be noted that some of the government-run informal certificate courses are not actually offered by TVET providers, but rather by specialized government agencies related to agriculture.

6.6.2. Types of TVET institutions surveyed

Overall, of the 202 TVET providers surveyed, 44 stated that they provide training courses related to the agri-food sector: 34 in the Chattogram region and 10 in Cox's Bazar. Table 29 provides a breakdown of the TVET providers providing agri-food-related training based on the operator of the provider.

▶Table 30. Share of surveyed TVET providers offering agri-food-related courses

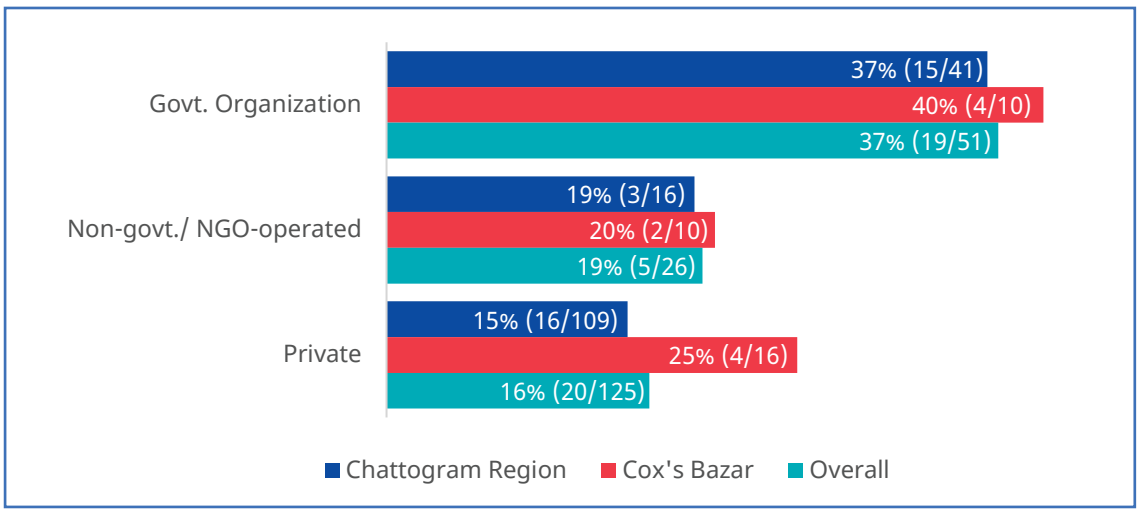
Region	No. of TVET providers surveyed	No. of agri-food-related courses available
Chattogram region	166	34
▶ Government-operated	41	15
▶ Non-govt/NGO-operated	16	3
▶ Private	109	16
Cox's Bazar	36	10
▶ Government-operated	10	4
▶ Non-govt/NGO-operated	10	2
▶ Private	16	4

Source: Survey with TVET providers.

Among the government-run TVET providers who were surveyed, 37 per cent said they offer agri-food courses (40 per cent in Cox's Bazar and 37 per cent in the Chattogram region), while this was the case for just 19 per cent of NGO-led TVET providers and 16 per cent of private TVET providers.

Only 20 per cent of the surveyed NGO-operated TVET providers in Cox's Bazar offered agri-food courses, which is relatively low compared to other sectors. In addition, only 25 per cent of the private TVET providers in Cox's Bazar provide training in agri-food, however, there are a few courses that can be attributed to multiple sectors, including agri-food.

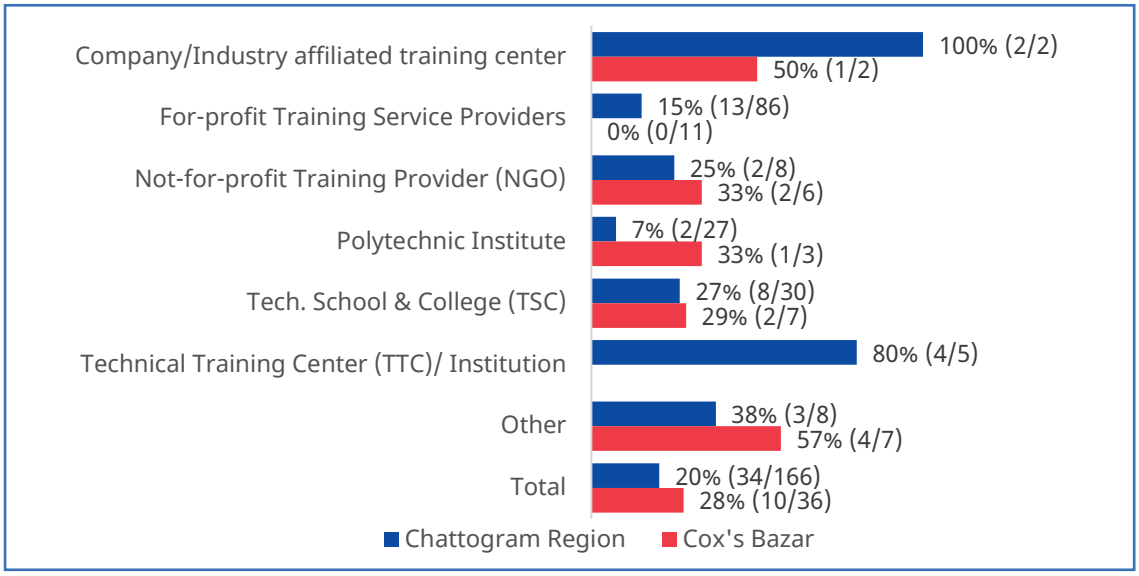
▶ Figure 132. Prevalence of agri-food-related courses in surveyed TVET providers, by owner/ operator of the provider (%)



Source: Survey of TVET providers.

Figure 135 provides a breakdown of the TVET providers offering agri-food sector-related courses by the type of the provider. One out of the three polytechnics that were surveyed in Cox's Bazar provides a diploma-level training courses related to agri-food. As noted above, there are two specialized Agriculture Training Institutes in the Chattogram region, but no other polytechnics offer diploma courses in agri-food-related subjects. Among the TTCs in the Chattogram region, four out of five stated that they offer courses related to the agri-food sector. Among TSCs, 27 per cent from Chattogram region and 29 per cent from Cox's Bazar region provide such courses. In Cox's Bazar, 33 per cent of the not-for-profit TVET providers have such courses, whereas in the Chattogram region it is 25 per cent. Fifteen per cent of the for-profit TVET providers in the Chattogram region also offer agri-food-related courses, but there are no for-profit TVET providers in Cox's Bazar offering agri-food-related courses, as they do feel there is sufficient demand.

▶Figure 133. Prevalence of agri-food-related courses in different types of TVET providers

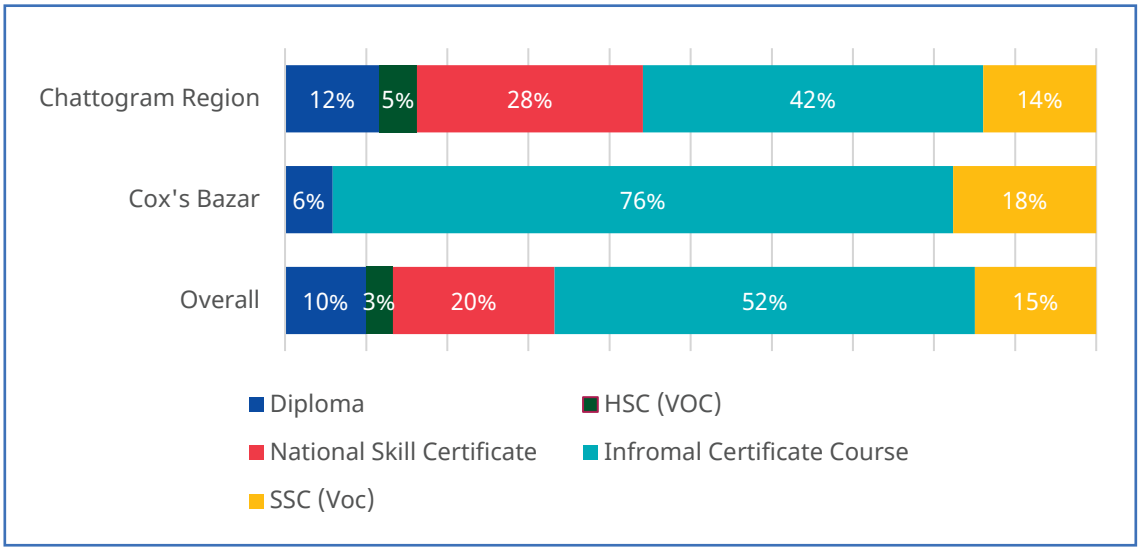


Source: Survey of TVET providers.

6.6.3. Level of skills programmes available

Overall, 17 agri-food-related courses were on offer among surveyed TVET providers in Cox's Bazar and 43 courses were on offer among surveyed TVET providers in the Chattogram region. In Cox's Bazar, about three-fourths of courses were informal programmes (76 per cent), with an additional 18 per cent being at the SSC (Voc) level and 6 per cent at the diploma level. There were no courses available at the NSC and HSC (Voc) levels. In the Chattogram region, informal programmes were also the most common, accounting for 42 per cent of agri-food-related programmes, but there was also more variety than what was seen in Cox's Bazar, with 28 per cent of agri-food programmes being at the NSC level, 14 per cent at the SSC (Voc) level, 5 per cent at the HSC (Voc) level, and 12 per cent at the diploma level.

▶Figure 134. Level of agri-food-related skills programmes available (%)

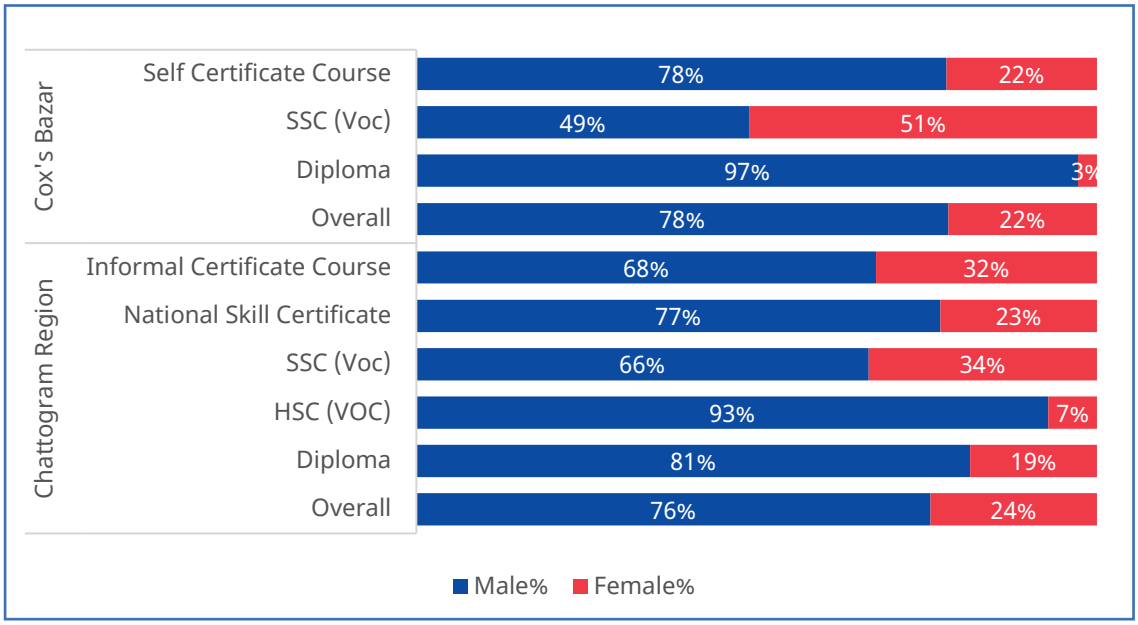


Source: Survey of TVET providers

6.6.4. Enrolment status by sex

Current enrollment data suggests that in the Chattogram region, males account for three-fourths (76 per cent) of all agri-food learners overall. Male trainees particularly dominate that the HSC (Voc) level in the Chattogram region, where they account for 93 per cent of students. The ratio of female trainees is highest in SSC (Voc) courses (34 per cent) and in informal programmes (32 per cent).

▶ Figure 135. Ratio of male and female trainees enrolled in agri-food-related programmes, by training programme level (%)



Source: Survey of TVET providers.

The overall ratio of males and females in Cox's Bazar is roughly the same as it is in the Chattogram region for agri-food-related courses. But in the diploma level courses only 3 per cent of the students are female in Cox's Bazar – versus 19 per cent in the Chattogram region. This indicates a reluctance among females to participate in higher-level agri-food-related courses in the Cox's Bazar area. Female learners actually make up a slight majority (51 per cent) of trainees at the SSC (Voc) level in Cox's Bazar, but this is because one of the three surveyed TVET providers that provide agri-food-related courses at this level is a female-only institution. In informal certificate courses, 22 per cent of the participants are female, which is again lower than what is seen in the Chattogram region (where it is 32 per cent).

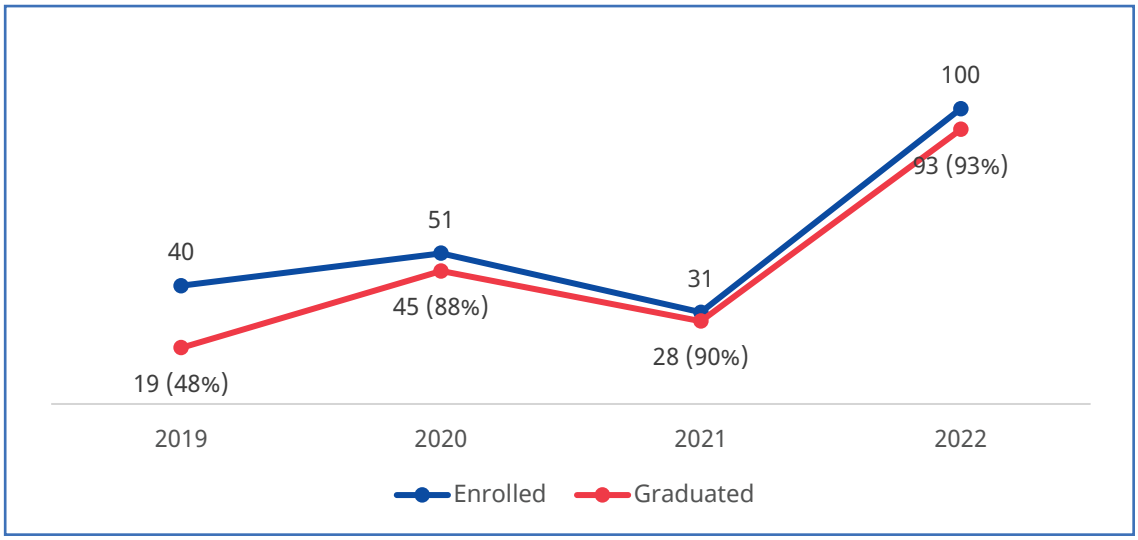
6.6.5. Number of graduates

The Chattogram region and Cox's Bazar have demonstrated differing trends in recent years when it comes to graduate numbers for the agri-food sector-related courses. Cox's Bazar has seen an upward trend over the period of 2019 to 2022. The growing demand for workers in the agri-food segments such as salt, fisheries, and seaweed is reflected in the increased number of graduates for the sector, with 93 trainees graduating in 2022, compared to just 19 in 2019.

By contrast, data for the Chattogram region shows a fluctuating scenario. Graduate numbers peaked in 2021 at 570, but then fell in 2022 to 484 graduates, which was not markedly different that was seen in 2019 (468).

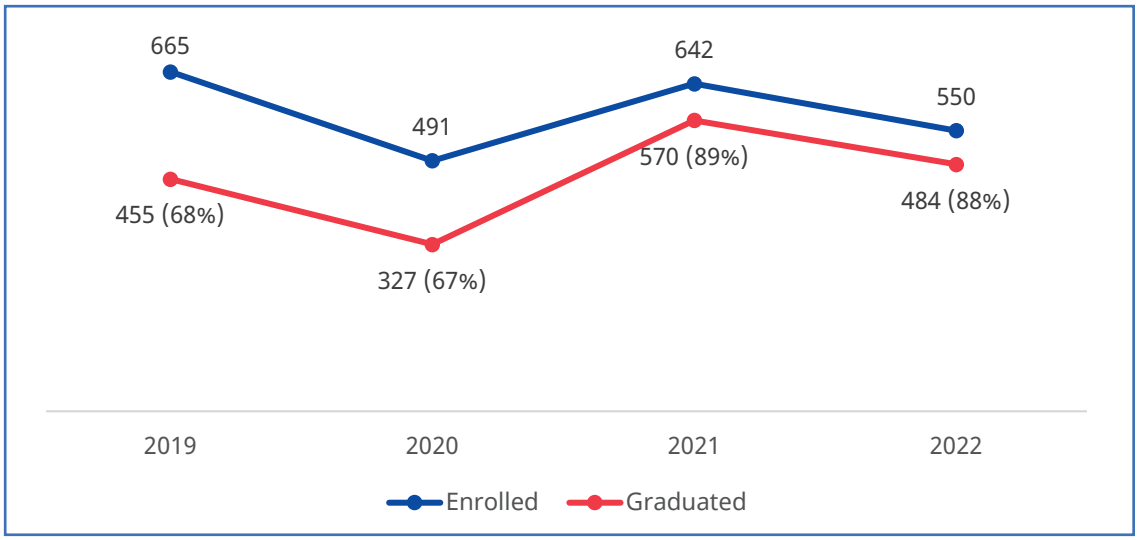
Based on conversations with TVET providers, it was found that there is a huge opportunity for them to incorporate a greater number of trainees, especially for the Chattogram Hill Tracts area, where there is room for a niche market based on agri-food sector that could attract more trainees.

▶ Figure 136. Enrolment and graduation numbers for agri-food-related programmes in Cox's Bazar, 2019–22



Source: Survey of TVET providers.

▶ Figure 137. Enrolment and graduation numbers for agri-food-related programmes in the Chattogram region, 2019–22

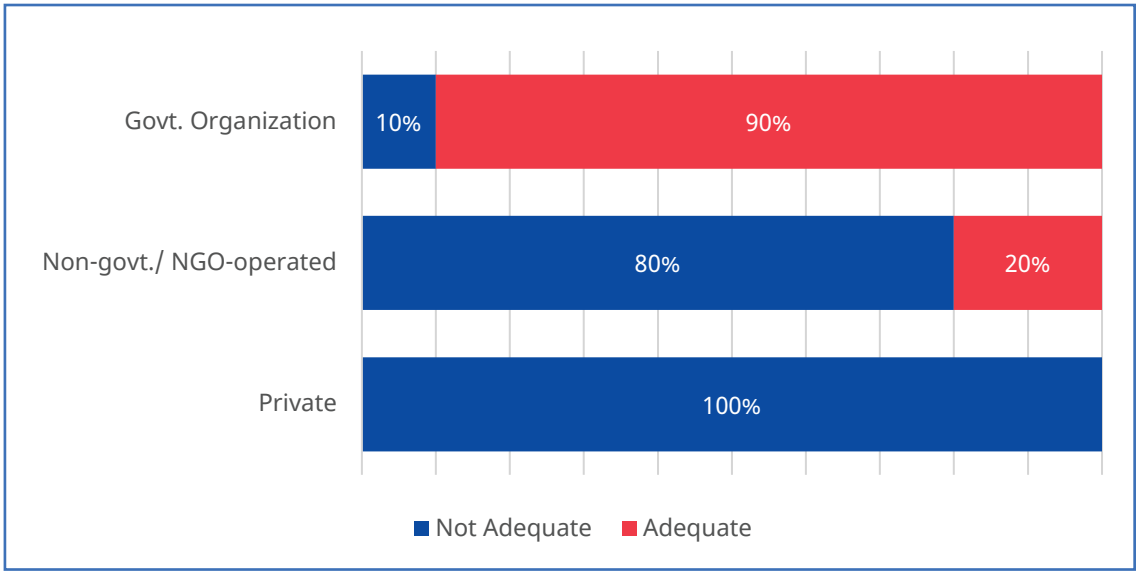


Source: Survey of TVET providers.

6.6.6. Adequacy of TVET providers' equipment

Figure 140 presents data on the equipment status of TVET providers offering agri-food-related courses in Cox's Bazar, as reported by the providers themselves. Eighty per cent of the NGO-operated providers said that they do not have adequate equipment for conducting agri-food courses. Because NGOs courses rely on funding rather than tuition payments, they tend to outsource equipment on a need basis. As a result, they generally do not own equipment on a permanent basis. The scenario is even worse among for-profit training providers, with 100 per cent of them stating that they do not have the necessary equipment for agri-food training. As with other sectors above, government-run TVET providers typically possess adequate equipment.

▶ Figure 138. Adequacy of training equipment in agri-food-related training programmes, by type of TVET provider (%)



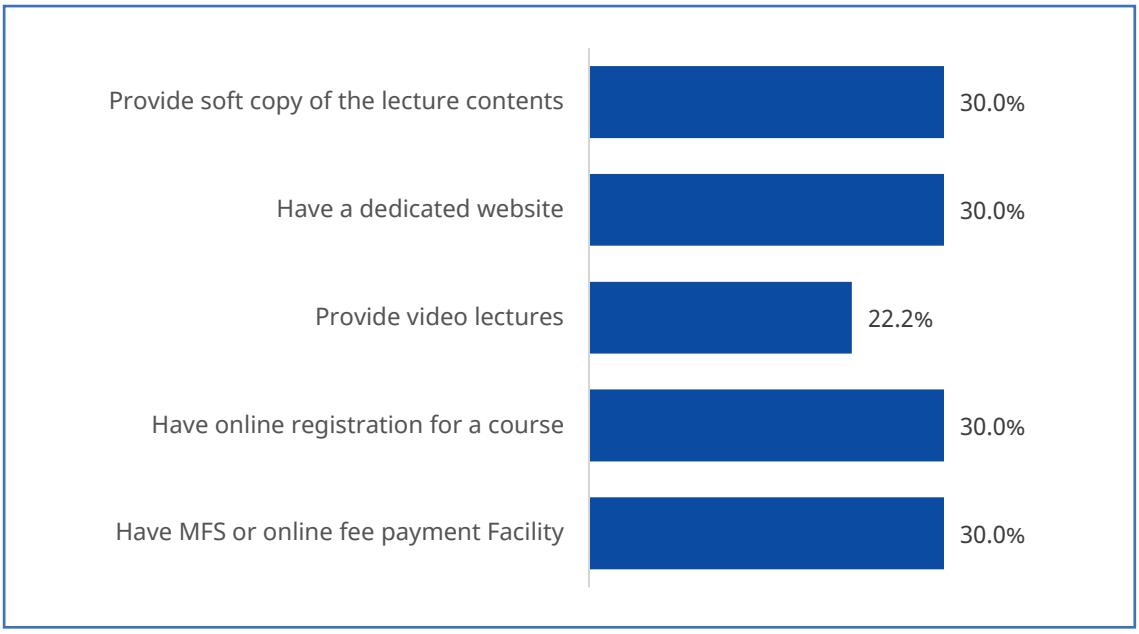
Source: Survey of TVET providers.

6.6.7. Digitization of TVET services

Digitization of services is becoming important for quality training. In the Chattogram–Cox's Bazar region very few TVET providers offer digital services related to agri-food courses. The most commonly noted digital services are providing video lectures, having websites, providing soft copies of lectures, and opportunities for online course registration. Digitization in agri-food training is at a comparatively lower level than what is seen in other sectors.

Thirty per cent of the TVET providers have a dedicated website, and 22 per cent facilitate video lectures, which here refer to Facebook Live videos, YouTube videos, and online classes. Mobile finance services (MFS) or online money transfer has become a crucial need for every sector. In the Chattogram–Cox's Bazar region, 30 per cent of TVET providers offering agri-food-related courses can accept course fees by mobile banking or online banking. In addition, 30 per cent have an online registration facility. All of the TVET providers who reported having online course registration are government-run.

▶ Figure 139. Digitization status of TVET providers in regard to agri-food sector-related programmes (%)

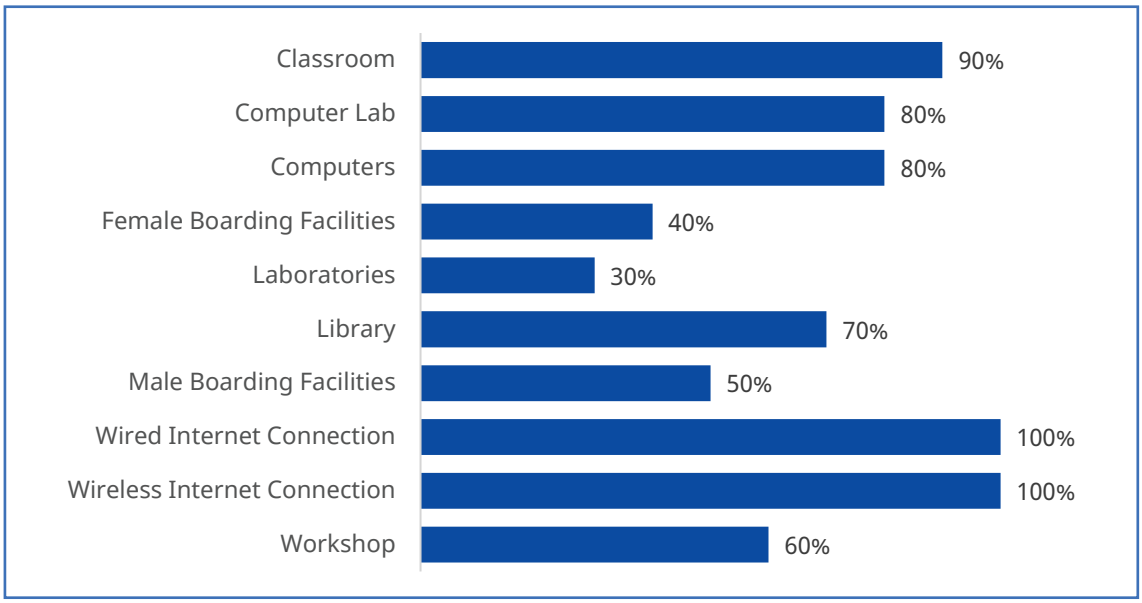


Source: Survey of TVET providers.

6.6.8. Status of facilities available at TVET providers

Figure 142 presents some of the commonly required facilities for TVET providers and the prevalence of such facilities in providers that offer agri-food-related courses. All of the TVET providers offering training in agri-food occupations have wired and wireless internet connections. Most (80 per cent) also have computer labs, as TVET providers typically also offer courses related to the ICT sector. More importantly, 40 per cent of the TVET providers have female boarding facilities, and 50 per cent have male boarding facilities. However, these boarding facilities are not dedicated only to agri-food course trainees. Most government TVET providers reported offering boarding facilities. In addition, 60 per cent mentioned that they have workshops to provide hands-on training to their agri-food trainees.

▶ Figure 140. Facilities available in TVET providers offering agri-food sector-related programmes (%)

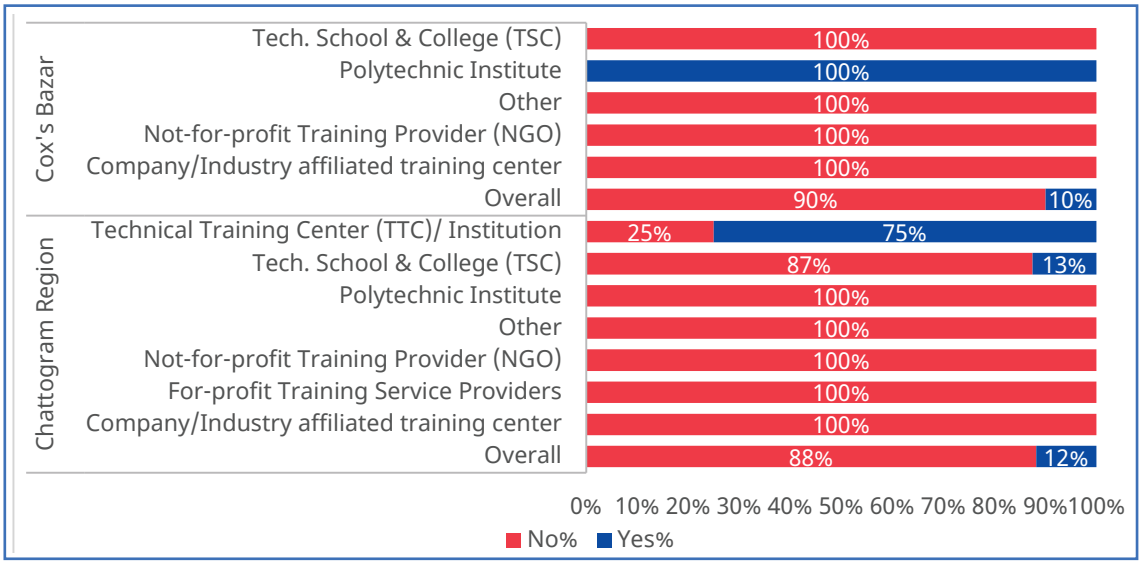


Source: Survey of TVET providers.

6.6.9. TVET providers' capacity to provide Recognition of Prior Learning

Figure 143 shows the proportion of TVET providers offering RPL for agri-food sector-related courses in Cox's Bazar and the Chattogram region. Overall, very few TVET providers are providing RPL for agri-food-related courses. The one polytechnic in Cox's Bazar offering an agri-food-related diploma offers RPL, and they are the only provider in Cox's Bazar to do so. The situation is much the same in the Chattogram region, with just 12 per cent of the TVET providers with agri-food-related courses offering RPL, including three of the four TTCs and one of the eight TSCs.

▶Figure 141. Status of agri-food-related RPL offerings in TVET providers, by type of provider (%)

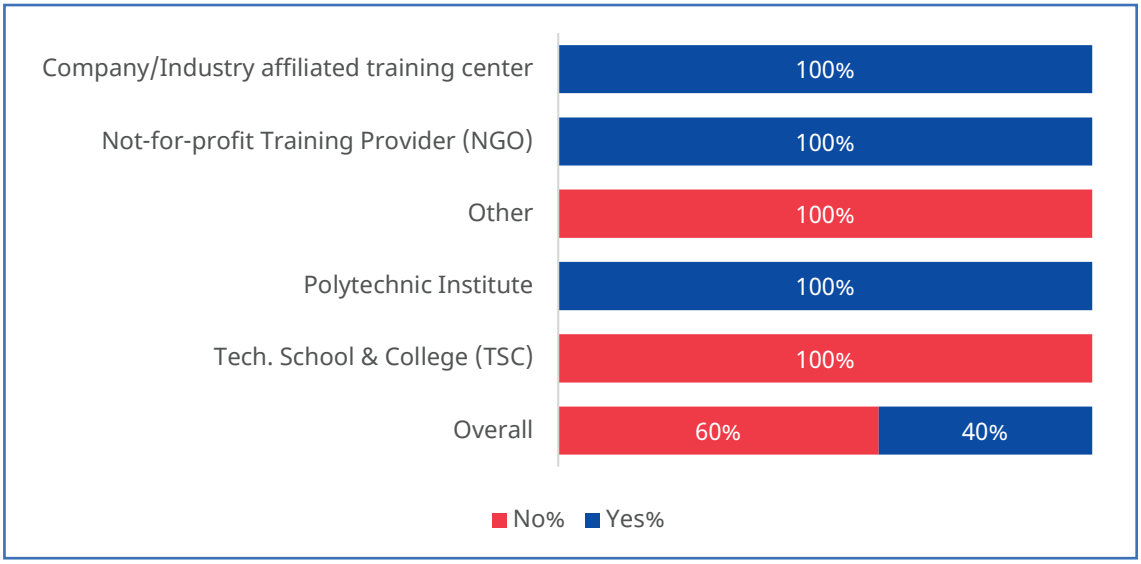


Source: Survey of TVET providers.

6.6.10. TVET provider collaborations/linkages with CBOs, NGOS and social organizations

The sustainability of a TVET provider can depends on its ability to engage and collaborate with social and community-based organizations. Overall, 40 per cent of the TVET providers offering agri-food-related courses reported being engaged in collaboration and cooperation with CBOs, NGOs and social organizations. Among them, all of the polytechnics, not-for-profit providers, and company-affiliated institutions said that they have some kind of linkage or collaboration with different types of social and community-based organizations.

▶ Figure 142. Status of collaboration of TVET providers with CBOs, NGOs and social organizations on agri-food-related programmes (%)

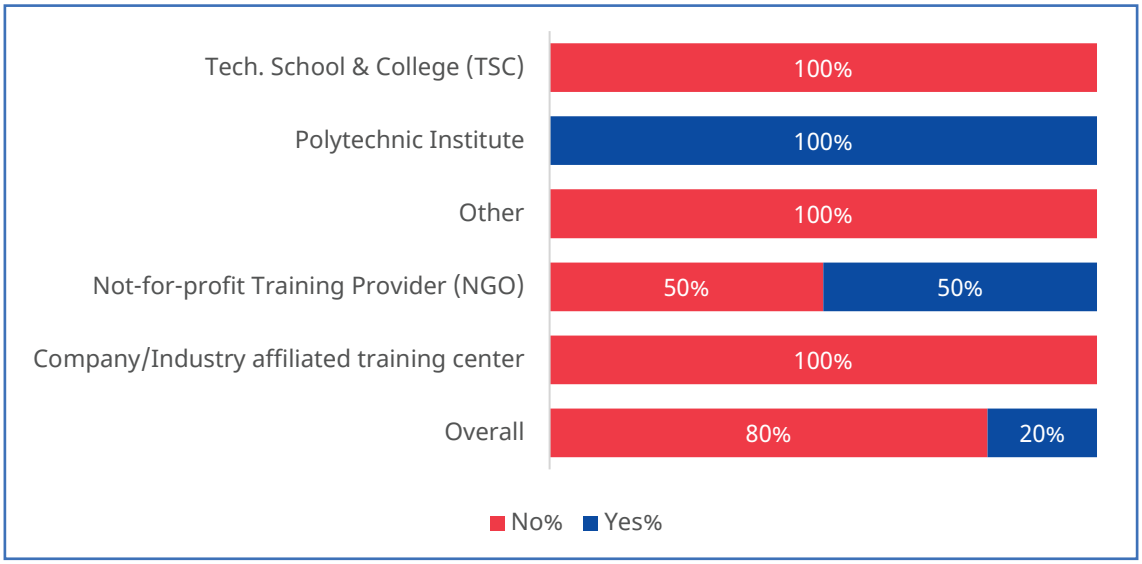


Source: Survey of TVET providers.

6.6.11. Share of TVET providers with placement cells for graduates

Placement cells work as intermediaries for graduates to engage with industry, including to find employment. In the Chattogram–Cox's Bazar region, just 20 per cent of the TVET providers offering agri-food-related courses mentioned that they have a functional placement cell for graduates. All of the polytechnics reported have placement cells, which is not surprising as it is mandatory for government polytechnics to have a placement cell for graduates. Half of the not-for-profit TVET providers also reported having placement cells. Other than that, no other provider type has a formal placement cell. However, many TVET providers conduct some placement activity informally through personal connections and long-standing relationships with employers.

▶ Figure 143. Share of TVET providers offering agri-food-related programmes that have placement cells for graduates (%)

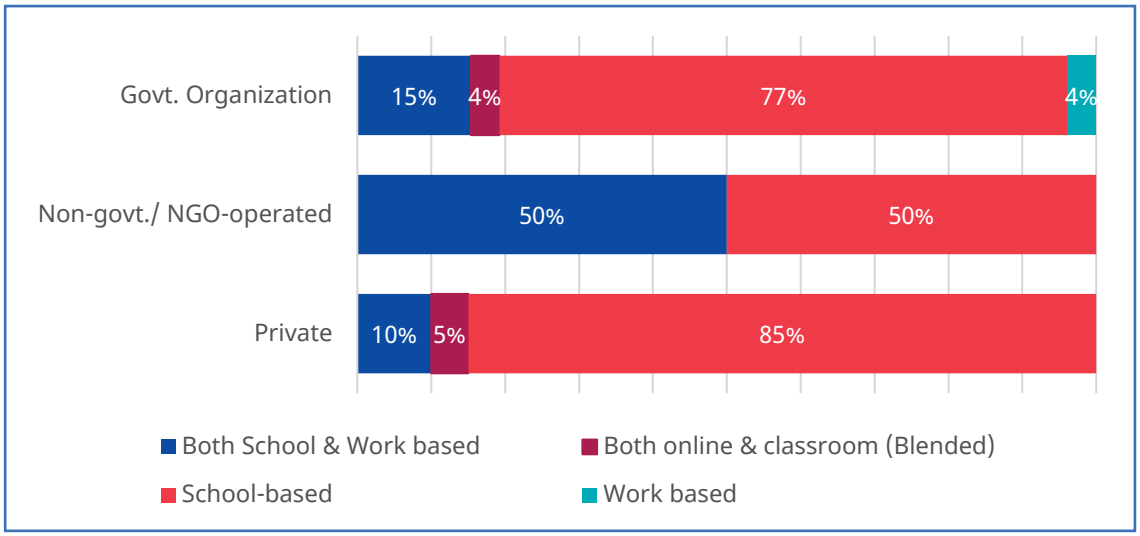


Source: Survey of TVET providers.

6.6.12. Course delivery mechanism

In delivering courses, most of the TVET providers offering agri-food-related programmes only deliver these courses through school-based teaching. Private TVET providers and government-run providers are particularly focused on using only school-based delivery methods (85 per cent and 77 per cent, respectively). Five per cent of the private TVET providers also stated that they use a blended delivery approach (part online and part in the classroom), and 10 per cent use a combination of school-based and work-based approaches. Among the ten NGO-operated providers, half reported using a school and work-based approach; while the other half use a solely school-based approach. The blended approach was not used by any NGO-run providers, although 4 per cent of government-run TVET providers did use a blended method. As agri-food courses sometimes need to be based on the field, 4 per cent of the courses delivered by government providers were fully work-based, such as for fish cultivation and seaweed cultivation.

▶ Figure 144. Course delivery method for agri-food sector-related TVET programmes, by owner/operator of the TVET provider (%)



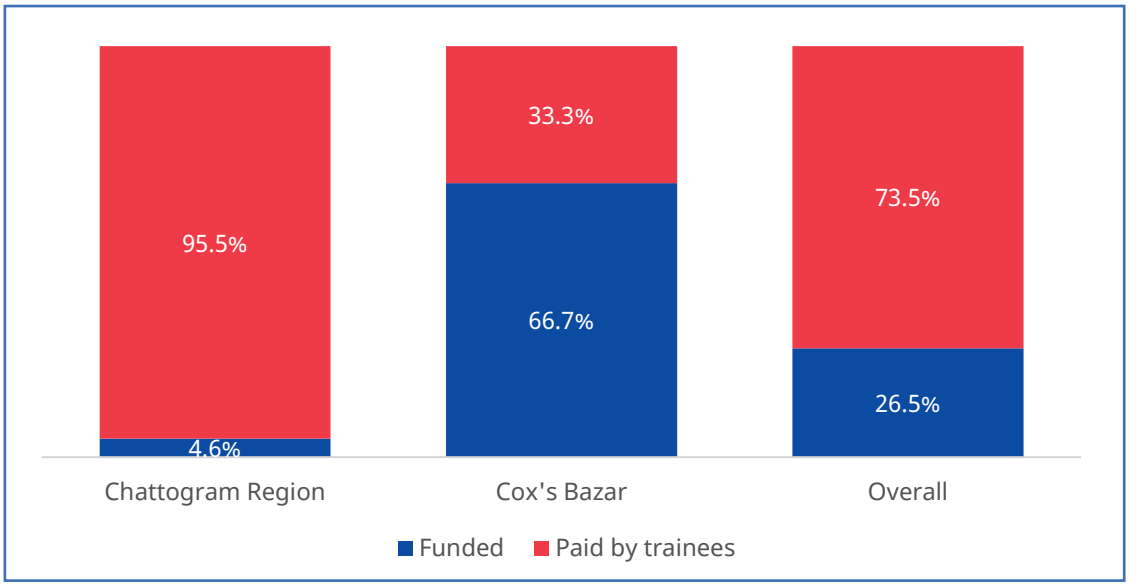
Source: Survey of TVET providers.

6.6.13. Source of tuition fees for courses

In Cox's Bazar, agri-food sector courses are dominated by the funded model, which means the Government or a donor agency covers the tuition fee of the trainees. The course fee is paid by government and development donors. Two-thirds of the agri-food sector courses in Cox's Bazar are funded one. This is because most of the agri-food-based courses in Cox's Bazar are offered by government agencies.

In Chattogram, however, exceedingly few courses are funded ones, with the vast majority 95.5 per cent requiring tuition payments from trainees.

▶Figure 145. Sources of tuition fees for agri-food-related TVET programmes (%)

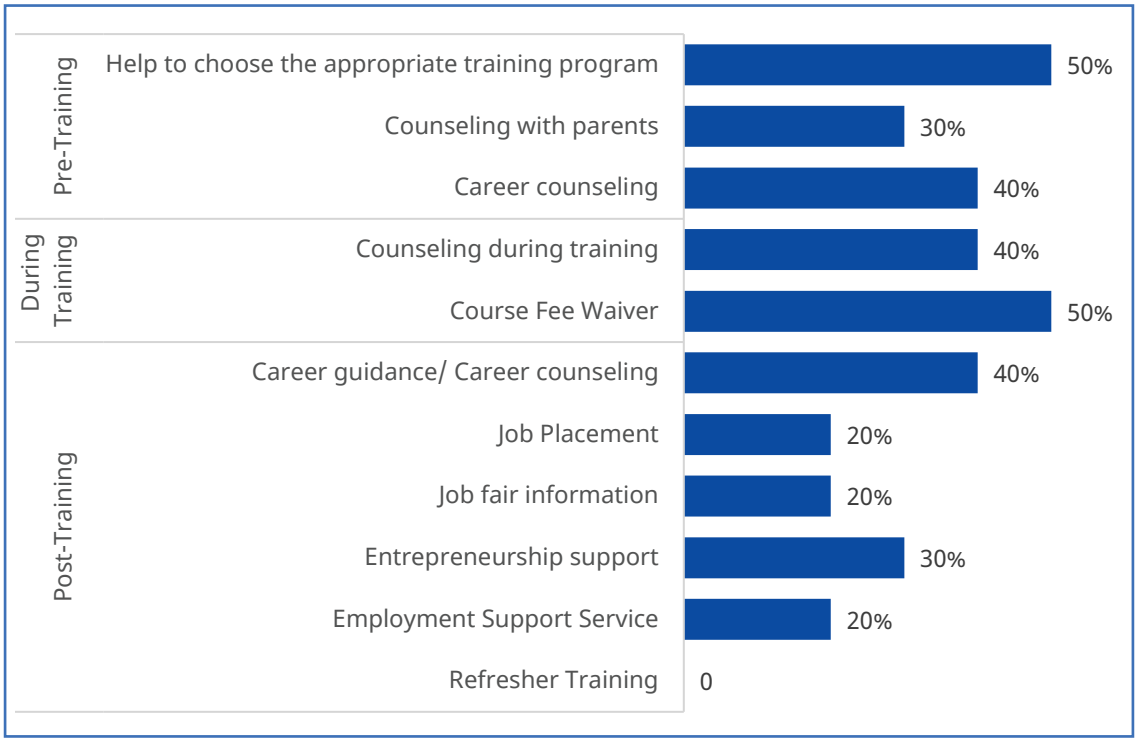


Source: Survey of TVET providers.

6.6.14. TVET providers' support services

TVET providers offering agri-food-related courses offered an array of pre- and post-training support services for]trainees, while also providing some support services during training. The most commonly reported pre-training support services were vocational guidance, counseling with parents, and career counseling. Forty per cent also reported providing counseling during training, and 50 per cent said they consider course fee waivers for trainees if needed. A few TVET providers also reported they conduct motivational sessions and give scholarships to the trainees. Career guidance was the most commonly reported post-training support service (40 per cent). Some TVET providers also try to arrange jobs for graduate trainees if any opportunity is available (20 per cent). Moreover, employment support services, job fair information, and entrepreneur support services were a few of the post-training support services reported by some TVET providers for agri-food course trainees.

▶ **Figure 146. Support services available at TVET providers offering agri-food-related programmes (%)**



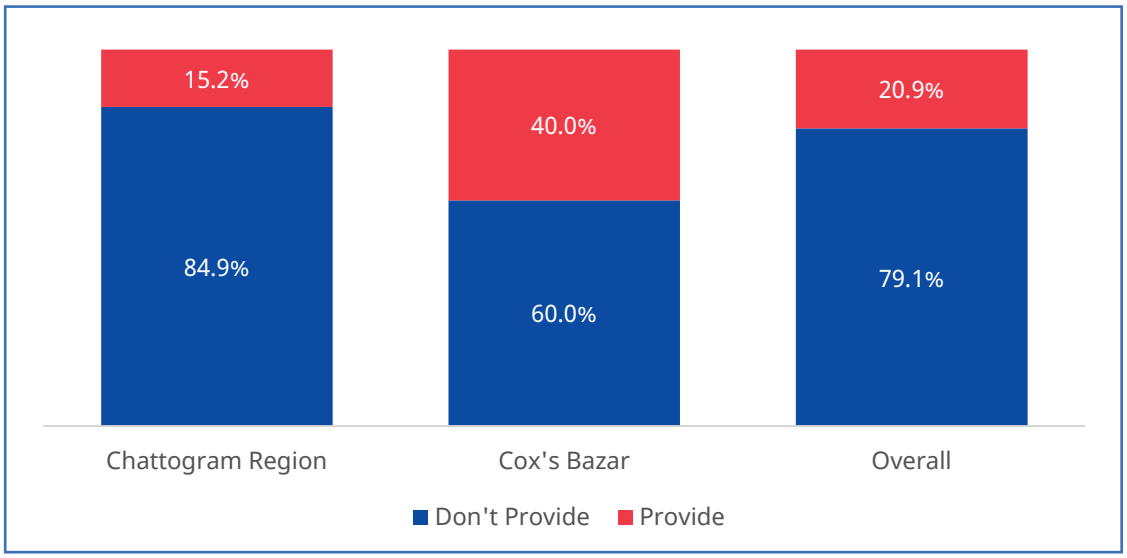
Source: Survey of TVET providers.

6.6.15. Status of work-based learning, including apprenticeships

Formal apprenticeships can be crucial in technical and vocational education, but as most of the jobs in the agri-food sector are informal in nature, the opportunity for formal apprenticeship is quite low. Indeed, it was found that there were no formal apprenticeships available for agri-food trainees in the targeted areas. A few TVET providers do, however, arrange apprenticeships in a very informal capacity. Overall, 20.9 per cent of the TVET providers stated that they try to arrange apprenticeships for their trainees. In Chattogram this rate is even lower (15.2 per cent). However, TVET providers of Cox's Bazar seemed more determined to arrange apprenticeships, with 40 per cent of the TVET providers stating that they try to

do so, at least for a short period of time. In the Chattogram Hill Tracts area apprenticeship opportunities are particularly hard to come by.

▶ Figure 147. Availability of apprenticeship opportunities linked to agri-food-related TVET programmes (%)



Source: Survey of TVET providers.

6.6.16. Internal factors affecting the sustainability of TVET providers

The matrix in Table 30 below lists a few internal factors that indicate how providers operate at a structural level, which has a direct impact on their sustainability and future growth. TVET providers offering agri-food-related courses were asked if they have a strategic plan, a separate HR department, a separate accounts department, and perform internal financial audits. According to the providers, half (50 per cent) of the not-for-profit TVET providers have strategic plans, and annual work plans; whereas all of the company-affiliated training centres lack annual work plans. Polytechnic institutes stated that they have/maintain all the factors mentioned in the matrix.

▶ Table 31. Presence of internal factors affecting the sustainability of TVET providers offering agri-food-related courses

Internal factor	Company/ industry-affiliated training centres	Not-for-profit TVET providers (NGOs)	Polytechnic institutes	TSCs	Other
Have strategic plan/ long-term plan	100%	50%	100%	100%	100%
Have annual work/ operational plan for employees	0%	50%	100%	100%	100%
Have separate HR department	100%	100%	100%	0%	75%
Have HR policy	100%	50%	100%	50%	75%
Have separate accounts department	100%	100%	100%	100%	100%
Perform internal financial audit	100%	100%	100%	100%	100%
Audited by external auditor	100%	100%	100%	100%	100%

TSCs = Technical schools and colleges. Source: Survey of TVET providers.

6.6.17. Future plans and sustainability mechanisms of TVET providers

In the agri-food sector, the prevalence of TVET courses is considerably low. In the Chattogram region, nearly all of the providers are tuition-fee based, which may help ensure their long-term viability. In Cox's Bazar, however, the providers who are offering agri-food sector-related courses are mostly government-run or NGO-operated. As a result, most of the trainees do not have to pay any course fees. In addition, for-profit TVET providers in Cox's Bazar are reluctant to offer run agri-food sector-based courses, as they do not feel that demand is adequate. This being the case, for some years donors and the Government will have to fund agri-food-related courses to keep the TVET providers sustainable into the future.

▶ 6.7. Sector-specific key supply side systemic constraints and challenges

6.7.1. Relevance of curricula and qualifications

The curricula of the agri-food training courses are not well attuned with the changing trends and needs of the industry. As a result, TVET providers deliver an inadequate supply of workers equipped with the skills the agri-food industry needs. FGD insights indicate that curricula need to be more oriented toward meeting industry needs and thus enabling more market-focused skill supply. By contrast, the present scenario suggests that students face constraints in accessing jobs in the industry due to lack of adequate skills required to meet the criteria mentioned in job descriptions.

Moreover, curricula calibrated to the needs to persons with disabilities should be introduced to foster an inclusive environment. For example, a curriculum for persons with visual impairments can serve as a driver to ensure that no-one is left behind by enabling visually impaired trainees to ultimately access a quality life and stay out of poverty. From interviews with BTEB officials, it was noted that curricula of short courses are not designed in consideration of persons with disabilities. However, for diploma courses, there is evidence of curricula being designed in consideration of this segment of the population and that these curricula are being implemented in these TVET providers.

6.7.2. Delivery and assessment practices

In delivering both formal and informal courses, instructors need to be oriented towards modern methods of teaching and orienting students. In a discussion with the principal of a TVET provider, the study team found that trainers need to continuously update their own skills, knowledge and training techniques to respond to new skills demands, delivery methods, and assessment methods.

There is also a need for more female instructors, both to teach students and to promote inclusiveness. Some FGD participants mentioned the lack of female instructors as one of social barriers that hinders female students from to enrolling in courses.

▶ 6.8. Skills gap analysis

Through secondary research, FGDs, KIIs, and the STED Workshop it was possible to identified the most in-demand occupations for the agri-food sector and the skills associated with these occupations. On the other side of the equation, the skills supply assessment identified the supply of skills development programmes related to the sector. Based on the information gathered through the two assessments and from stakeholders at the STED Workshop, the training gap analysis table below was constructed. Table 31 shows major occupations in the agri-food sector, the relevant skills training required, and the degree to which this training is available. Availability frequency was derived from the frequency with which a specific course/training was reported by TVET providers and how related that skill training is to each specific occupation.

▶Table 32. Training gap analysis for priority occupations in the agri-food sector

Major occupations	Skills training needed from TVET providers	Availability of training	Remarks
Food Safety and Hygiene Technician	▶ Cleaning and sanitizing foods, tools and equipment, ▶ Safe food handling, ▶ Inspecting and sorting materials and products, ▶ Managing wastage, ▶ Monitoring and controlling pests	Not available	
Baker	▶ Baking	Adequately available	
Food Preservation Technician	▶ Food processing and preservation	Inadequately available	
Food Packaging Technician	▶ Packaging	Not available	Only one informal skills training programme was found in Chattogram
Meat and Poultry Processing Worker	▶ Poultry rearing, ▶ Livestock rearing	Inadequately available	No formal skills training is available on poultry and livestock rearing
Fish and Seafood Processing Worker	▶ Fish and seafood, ▶ Fish cultivation, ▶ Seaweed food and beverage, ▶ Dry fish processing	Inadequately available	Few informal skills trainings are available. Those that are available are provided by particular government agencies.
Dairy Processing Worker	▶ Pasteurization, ▶ Fermentation	Not available	
Refrigeration Technician	▶ Maintaining temperature in manufacturing unit and storage	Not available	
Waste Management	▶ Waste collection and segregation, ▶ Recycling	Not available	

There is a clear vacuum of skills training for the agri-food sector. The training courses that are already being provided are mostly by few specialized government bodies. Food safety, food preservation, and fish processing are all areas where there is a clear need for more skills training.

▶ 6.9. Recommendations

The STED Workshop served as a forum for stakeholders to not only validate the outcomes of the surveys, FGDs and KIIs, but also to contribute additional perspectives. It facilitated the development of a collective comprehension regarding skills needs and challenges in the agri-food sector. Moreover, this collaborative platform enabled stakeholders to generate recommendations aimed at addressing the identified and prioritized skills needs and challenges, fostering a pathway for future growth and success in the sector.

Specific occupational skills

- Integrate comprehensive training on food safety standards, quality control measures and regulatory compliance to ensure that workers are well-versed in maintaining high standards in agri-food manufacturing. Develop expertise in food packaging and labeling techniques to meet industry standards and enhance the marketability of agri-food products. Also provide training on the integration of automation and technology in agri-food manufacturing processes, including the use of machinery for processing and packaging.
- Considering that Chattogram is a hub for agri-food manufacturers, skill development courses on packaging can be considered primarily. In addition, diploma courses in electrical engineering are also in demand in the industry for operating and maintaining machinery.
- Skills development programmes on food processing, such as pickle, dried fish and seaweed-based food processing, can be considered for entrepreneurship training.
- Agri-food processing skills, such as sorting, grading, washing, peeling, cutting, drying, milling, packaging, and labeling various agricultural products, such as fruits, vegetables, grains, pulses and spices have high potential. Short courses regarding these skills can be introduced.

Core work skills

- Emphasize the importance of collaboration and teamwork in agri-food manufacturing, where coordinated efforts are essential for seamless operations, especially in factory settings.
- Business management, market linkage and social media marketing training will be necessary for entrepreneurship-focused training courses.
- Food safety and quality skills in areas such as hygiene, sanitation, preservation, storage and testing of agri-food products and compliance should be more prevalent, and align with the national and international standards and regulations, such as HACCP, ISO, and so on.

Collaboration between employers and training providers

- **Industry–TVET provider partnerships:** Establish partnerships between TVET providers and agri-food industry players to align training programmes with industry needs and to provide students with practical experience.
- **Joint training programmes:** Collaborate on the development of joint training programmes that combine theoretical knowledge with hands-on experience, ensuring graduates are well-prepared for the agri-food industry.

Access to skills development, social inclusivity and lifelong learning

- Implement RPL mechanisms to recognize and incorporate the skills and experiences of individuals who have acquired expertise through non-formal channels.
- Ensure that training programmes are accessible to individuals with disabilities, by providing necessary accommodations and resources to foster inclusivity.

Wider systemic changes

- Except homemade food making, other skills connected to agri-food processing skill training – such as packaging, fish cultivation, livestock rearing and salt cultivation – need to be given in industry premises to ensure demand-driven and real0time skill development. This being so, the BTEB can advocate for industries to provide short training courses on the industry premises and provide work-based learning to enable hands on experience and learning.

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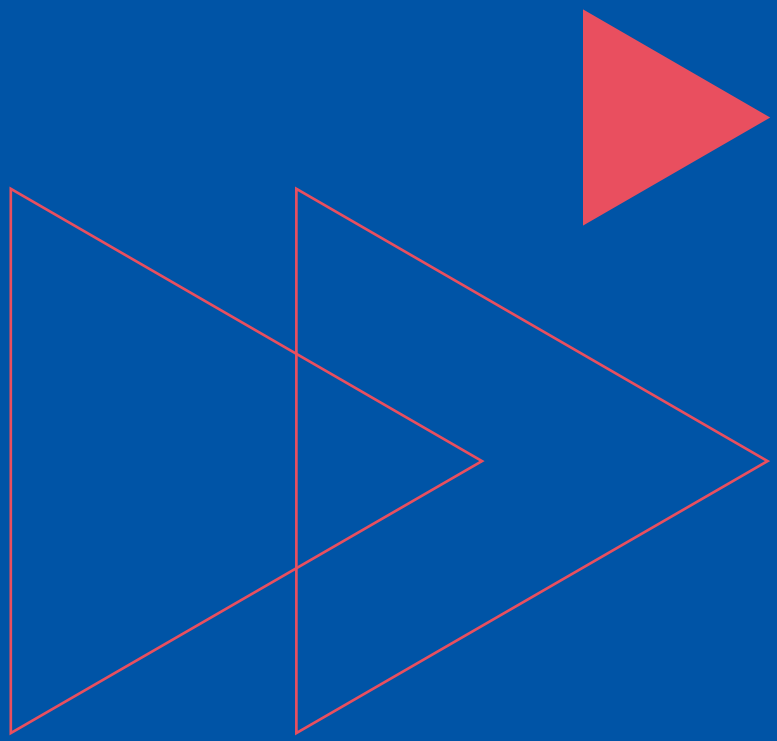

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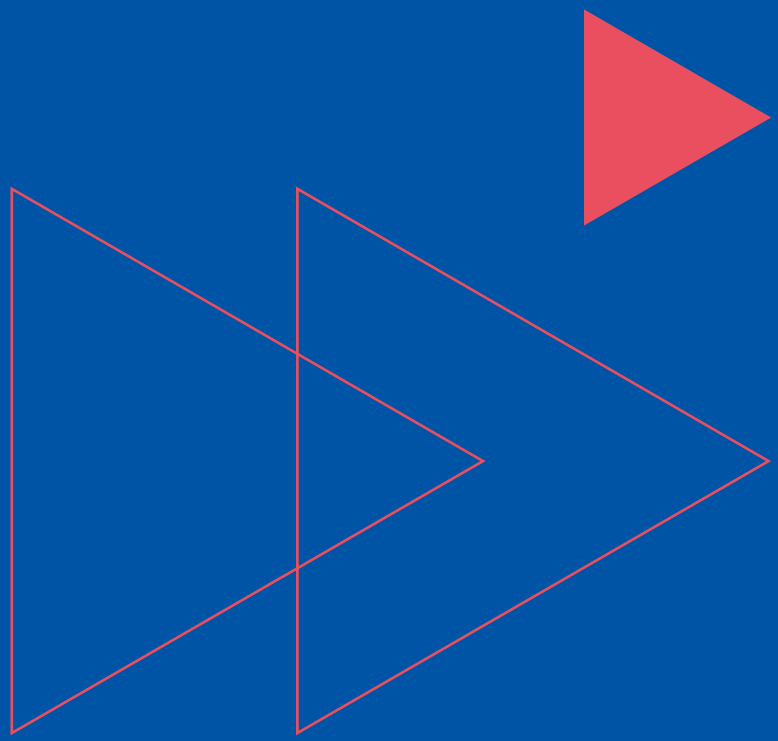
Annexes



Annexes

▶ Annex 1. Skills demand assessment methodology

Quantitative approach

In applying quantitative data collection techniques, the following steps were followed to collect data for four of the five priority economic sectors:

The research team employed a multistage probability sampling design to collect data from diverse stakeholders within the enterprises in the study area. This encompassed the five districts of the region under consideration for the study. The team arrived at the sample size through the utilization of Cochran's formula, which incorporated a design effect, as specified in the following equation:

$$n = \frac{P\,(1-P)(Z95\%)^2}{(P-p)^2}$$

Where P = Proportion to be estimated = 50 per cent, which gives statistically significant sample size; P – p = Margin of error; Z95% = Z-value at the 95 per cent confidence level; n = Size of sample.

Considering the appropriate power of the statistical representation at the level of units of analysis, we found that a confidence level of 95 per cent and an acceptable margin of error of 5 per cent with a 50 per cent maximum variability (expected prevalence) of the proportion gave us an effective sample size of 385 business establishments. The ESS was conducted only on the four priority sectors of construction, tourism, transportation and manufacturing. The number of establishments in these sectors within the five selected districts were collected from Bangladesh Economic Census 2013, as guided by the ToR. Annex table 1 below shows the numbers of these establishments in each district.

▶Annex Table 1. Total number of business establishments in four priority sectors, by district

Sector	District					Total
	Bandarban	Khagrachari	Rangamati	Chattogram	Cox's Bazar	
Construction	3	21	29	207	24	284
Tourism	2375	3889	2374	35744	7183	51565
Transport	284	1113	524	14999	6728	23648
Manufacturing	2957	6333	7604	58620	13441	88955
Total	**5619**	**11356**	**10531**	**109570**	**27376**	**164452**

Source: Bangladesh Economic Census (2013).

The total sample number of 385 establishments was distributed among the sectors and districts proportionately. A little adjustment of sampling was proposed here to ensure better representation of among the various sectors and districts. Fractions were rounded up, and as such the total sample number slightly increased to 401 establishments. The sample distribution is shown in annex table 2 below.

▶Annex Table 2. Distribution of establishments in the ESS survey sample, by sector and district

Sector	District					Total
	Bandarban	Khagrachari	Rangamati	Chattogram	Cox's Bazar	
Construction	1	1	2	4	2	10
Tourism	6	10	6	84	17	123
Transport	1	3	2	36	16	58
Manufacturing	7	15	18	138	32	210
Total	**15**	**29**	**28**	**262**	**67**	**401**

Note: The above sample distributions could also be further stratified according to the classification of industries and enterprises as large, medium, small and micro per the Bangladesh National Industry Policy 2022.

To account for the sampling design, which involves stratification across districts and subsectors, a study design effect of 2 was taken into consideration. As a result, the total sample size was established at 401 to fulfil these requirements.

- Multi-stage and stratified sampling methods were applied while determining samples of data collection from the key stakeholders in the five districts based on Bangladesh Economic Census 2013.
- The survey respondents were further stratified according to size category – large (250+ employees), medium (100–249), small (1–99) and micro (fewer than 10) – as per the definitions in the Bangladesh Industry Development Policy 2022.

Qualitative approach

In order to get a deeper understanding of the issues related to skills gaps and demand, qualitative data was collected from key stakeholders in both the public and private sectors. In doing so, a purposive sampling technique was employed for the collection of qualitative data from the targeted project locations. For the current study, key informant interviews (KIIs) and focus group discussion (FGDs) were conducted to fulfill the study objectives.

▶ Annex 2. Institutional mapping of the five priority sectors

▶Annex Table 3. Major institutions and stakeholders related to the construction sector

Institution/stakeholder	Role
Government bodies and ministries	
Ministry of Housing and Public Works	Formulates and implements housing and public works policies.
Ministry of Road Transport and Bridges	Oversees road and bridge construction and maintenance.
Ministry of Railways	Manages railway infrastructure development and maintenance.
Ministry of Power, Energy, and Mineral Resources	Responsible for the energy sector, including power projects.
Ministry of Local Government, Rural Development, and Cooperatives	Involved in local infrastructure development.
Ministry of Shipping	Oversees ports and waterways infrastructure development.
Regulatory bodies and authorities	
Bangladesh Economic Zones Authority (BEZA)	Oversees and promotes economic zones, including construction.
Bangladesh Bridge Authority	Plans, develops and maintains bridges and flyovers.
Bangladesh Power Development Board (BPDB)	Manages power generation and distribution infrastructure.
RAJUK (Rajdhani Unnayan Kartripakkha)	Regulates urban development and construction projects in Dhaka.
Industry associations and organizations	
Bangladesh Association of Construction Industry (BACI)	Represents the interests of the construction industry.
Real Estate & Housing Association of Bangladesh (REHAB)	Focuses on real estate and housing, contributing to construction.
Bangladesh Cement Manufacturers Association	Represents cement manufacturers, a key construction component.

Institution/stakeholder	Role
Educational and training institutions	
Bangladesh University of Engineering and Technology (BUET)	Provides education and research in engineering and architecture.
Technical Training Centers	Offer vocational training and courses for construction professionals and workers.
Financial institutions	
Bangladesh Bank	Influences monetary policy and provides financing for projects.
Commercial banks	Offer loans and financial support for construction projects.
Development partners and donor agencies	
Asian Development Bank (ADB)	Provides funding and technical assistance for infrastructure projects.
World Bank	Supports various development projects, including infrastructure.
Japan International Cooperation Agency (JICA)	Collaborates with Bangladesh on infrastructure and construction projects.
Environmental and safety regulators	
Department of Environment (DoE)	Monitors and regulates environmental impact assessments.
Directorate of Occupational Safety and Health (DOSH)	Enforces safety regulations at construction sites.
Local government bodies:	
City Corporations and Municipalities	Have authority over urban planning and construction within their jurisdictions.
Union Parishads	Oversee construction projects in rural areas.

▶Annex Table 4. Major institutions and stakeholders related the tourism sector

Institution/stakeholder	Role
National Tourism Council (apex body)	Oversees and guides the overall tourism and hospitality sector
Ministry of Civil Aviation and Tourism	Oversight of civil aviation and tourism-related matters
Bangladesh Tourism Board (BTB)	Responsible for promoting tourism and overseeing tourism activities
Bangladesh Parjatan Corporation (BPC)	Manages hotels, motels and tourism-related facilities
Forest Department	Manages tourism activities in protected areas like the Sundarbans
Ministry of Religious Affairs and Ministry of Cultural Affairs	Oversees heritage sites
Bangladesh Economic Zones Authority (BEZA)	By creating economic zones, BEZA helps to attract tourists
Bangladesh Power Development Board (BPC)	Development and maintenance of the power infrastructure for the growth of the tourism and hospitality sector
Bangladesh Investment Development Authority (BIDA)	Provides registration, counselling and aftercare services to businesses in the tourism and hospitality sector.
Hotels, motels and airports	Provide accommodation and travel services to tourists
Police, Immigration Department, and Statistical Agencies	Hold visitor and economic data.
Private sector	Increasingly involved in the tourism industry and vocal about decision-making
Technical experts	Provide specialized knowledge and expertise in the field of travel and tourism
Education and training providers	Provide knowledge and training to various occupational levels

▶Annex Table 5. Major institutions and stakeholders related to the transport sector

Institution/stakeholder	Role
Ministry of Road Transport and Bridges (MRTB)	Oversees major highways and bridges in the country.
Road and Highways Department (RHD)	Manages national and district roads and bridges, focusing on road infrastructure development and maintenance.
Ministry of Railways	Responsible for the railways in Bangladesh, governing Bangladesh Railways.
Bangladesh Railways	Operates and maintains the railway network, including passenger and freight services.
City Corporations	Responsible for urban roads and transportation within their respective city areas.
Ministry of Local Government, Rural Development and Cooperatives (MLGRDC)	Oversees rural road development and maintenance through the Local Government Engineering Department (LGED).
Local Government Engineering Department (LGED)	Focuses on rural road infrastructure development and maintenance.
Ministry of Shipping	Governs and manages inland waterways, seaports and shipping activities. Includes Chittagong Port Authority and Mongla Port Authority.
Chittagong Port Authority	Manages the Chittagong seaport, a major hub for external trade movements and container traffic.
Mongla Port Authority	Oversees the seaport in Mongla.
Bangladesh Inland Water Transport Authority (BIWTA)	Manages inland waterways, ensuring efficient domestic trade and connectivity with neighboring countries.
Land Port Authority	Regulates and manages land ports for cross-border trade.
Planning Commission	Responsible for coordinating investments and policies across various transportation modes. Plays a pivotal role in setting national priorities.
Transport NDC Working Group	A forum where key ministries collaborate on transport-related matters.
Dhaka Transport Coordination Authority (DTCA)	Focuses on strategic public transport planning and implementing improvements in the Dhaka metropolitan area.
Education and training providers	Provide transport-related education and training to practitioners as well as conducting research
Local governments	Various local government bodies at different levels, often lacking financial resources and relying on central government grants for development expenditures.

▶Annex Table 6. Major institutions and stakeholders related to the manufacturing sector

Institution/stakeholder	Role
Ministry of Industries	Formulating policies and strategies for the promotion, expansion and sustainable development of the sector
Bangladesh Chemical Industries Corporation (BCIC)	BCIC manages the production and marketing of important chemical products and fertilizers, playing a key role in supporting the agricultural sector, which is critical for the manufacturing of related goods.
Bangladesh Sugar and Food Industries Corporation (BFSIC)	This corporation oversees the sugar industry in Bangladesh, including the management of sugar mills and the marketing of sugar and molasses, which are crucial for the food manufacturing industry.
Bangladesh Steel and Engineering Corporation (BSEC)	BSEC is involved in the production and development of steel and engineering products, providing essential materials and services for construction and infrastructure, which are foundational for industrial and manufacturing activities.
Bangladesh Small and Cottage Industry Corporation (BSCIC)	Provides various services and support to small and cottage industries in Bangladesh. It offers infrastructure facilities, credit facilities, training and consultancy, marketing assistance, and so on.
Including Bangladesh Standards and Testing Institution (BSTI)	Develops and maintains standards and quality of products and services in Bangladesh. It conducts testing, certification, inspection and calibration of various products and services, such as food, drugs, textiles, electronics, and so on.
Bangladesh Industrial and Technical Assistance Center (BITAC)	Provides technical support and assistance to industrial entities, including training, research and development services to improve manufacturing processes.
Bangladesh Institute of Management (BIM)	Offers management training and development programmes aimed at enhancing the efficiency and skills of managers in the manufacturing sector.
Department of Patents, Designs and Trademarks (DPDT)	Responsible for the registration and protection of intellectual property, ensuring that innovations in manufacturing can be legally safeguarded.

Institution/stakeholder	Role
National Productivity Organization (NPO)	Works to enhance productivity levels across various sectors, including manufacturing, by promoting best practices and productivity-enhancing techniques.
Office of The Chief Inspector of Boilers	Ensures the safety and regulatory compliance of boiler operations within manufacturing facilities, which is crucial for industries reliant on steam and power.
Bangladesh Accreditation Board (BAB)	Offers accreditation services that ensure conformity assessment bodies such as laboratories and certification organizations meet international standards, supporting the credibility of manufactured goods for export.
Including the Small and Medium Enterprise Foundation (SMEF)	Provides policy and strategic support for the development of small- and medium-sized enterprises in the manufacturing sector, including access to finance, training and market development.
Small, Micro and Cottage Industry Foundation (SMCIF)	Aims to promote and support the small, micro and cottage industries, which are a significant part of the manufacturing sector, by providing financial assistance, training and market linkage support.
Bangladesh Investment Development Authority (BIDA)	Promotes and facilitates domestic and foreign investment in Bangladesh. It provides various services and support to the investors, such as one-stop service, information and guidance, policy advocacy, and so on.
World Bank (as development partner)	The World Bank provides guidance and assessment on the manufacturing sector's productivity and technology adoption in Bangladesh. It emphasizes the need for strengthening innovation and technology adoption in firms, improving managerial and workers' capabilities, connecting to international markets, and developing complementary markets and institutions.
Bangladesh Export Processing Zones Authority (BEPZA)	Provides various incentives and facilities to the investors and exporters in the EPZs, such as tax holidays, duty-free imports, repatriation of profits, and so on.
Federation of Bangladesh Chambers of Commerce and Industry (FBCCI)	The apex trade body of Bangladesh, which represents the interests and views of the private sector. The FBCCI acts as a bridge between the Government and the business community, and provides various services and support to its members, such as policy advocacy, trade promotion, dispute resolution, and so on.

Institution/stakeholder	Role
Bangladesh Garment Manufacturers and Exporters Association (BGMEA)	The trade body of the ready-made garment (RMG) industry in Bangladesh. It represents the interests and views of RMG manufacturers and exporters in Bangladesh, and provides various services and support to its members, such as policy advocacy, trade promotion, training and development, social compliance, and so on.
Bangladesh Association of Pharmaceutical Industries (BAPI)	Represents the interests and views of pharmaceutical manufacturers and exporters in Bangladesh, and provides various services and support to its members, such as policy advocacy, trade promotion, research and development, quality assurance, and so on.
Bangladesh Ceramic Manufacturers and Exporters Association (BCMEA)	Represents the interests and views of ceramic manufacturers and exporters in Bangladesh, and provides various services and support to its members, such as policy advocacy, trade promotion, training and development, quality control, and so on.
Bangladesh Shipbuilders Association (BSA)	The trade body of the shipbuilding industry in Bangladesh. It represents the interests and views of shipbuilders and exporters in Bangladesh, and provides various services and support to its members, such as policy advocacy, trade promotion, research and development, technical assistance, and so on.
Bangladesh Electrical and Electronics Manufacturers Association (BEEMA)	The trade body of the electrical and electronics industry in Bangladesh. It represents the interests and views of electrical and electronics manufacturers and exporters in Bangladesh, and provides various services and support to its members, such as policy advocacy, trade promotion, training and development, quality control, and so on.
Industry and trade associations, including: BGMEA, BKMEA, BTMA, BEIOA, BCCI, CCCI, FICCI, BAB, BASIS, SMEF, BSCIC, NASCIB, BEA and other relevant associations	Support and promote business establishments, their growth, markets, regulations, control, check and balance, skills development, product development and promotion, technology promotion, and so on.
Bangladesh University of Engineering and Technology (BUET)	Provides education and research in engineering and architecture.
Technical Training Centres, BMET	Offer vocational training and courses for construction professionals and workers.
Public and private schools, polytechnic institutes, colleges and universities with TVET courses	Offer secondary- and tertiary-level TVET courses for construction professionals and workers.
NGO-run training institutes	Offer vocational training and short courses for construction professionals and workers.

▶Annex Table 7. Major institutions and stakeholders related to the agri-food sector

Institution/stakeholder	Role
Bangladesh Bank	Regulates and supervises financial institutions, including banks, in the agri-food sector.
Bangladesh Small and Cottage Industries Corporation (BSCIC)	Supports and promotes small and cottage industries involved in agri-food processing.
State-owned and Private Commercial Banks	Provide financial services and credit facilities to agri-food businesses for growth.
Financial institutions/micro-finance institutions	Offer microfinance and financial support to small-scale agri-food enterprises.
Bangladesh Rural Development Board (BRDB)	Works on rural development projects and infrastructure, benefiting agri-food communities.
Business Intelligence (BI)	Provides data and information for informed decision-making in the agri-food sector.
Export Promotion Bureau (EPB)	Promotes and facilitates the export of agri-food products to international markets.
WTO Cell of the Ministry of Commerce	Handles World Trade Organization-related matters concerning agri-food trade.
Bangladesh Foreign Trade Institute (BFTI)	Offers training and research to enhance foreign trade skills, including agri-food exports.
Directorate of Women Affairs	Empowers women in the agri-food sector and promotes gender equality.
Department of Agricultural Extension (DAE)	Provides agricultural knowledge and support to agri-food producers and farmers.
Bangladesh Agricultural Research Institute (BARI)	Conducts research to improve agri-food production and quality.
Bangladesh Council of Scientific and Industrial Research (BCSIR)	Supports scientific research and innovation in agri-food technology.
Bangladesh Agricultural University (BAU)	Educates and trains students in agri-food science and technology.
Bangladesh Standards and Testing Institution (BSTI)	Sets standards and ensures quality control for agri-food products.
Office of the Joint Stock Companies and Firms	Registers and regulates agri-food-related businesses and companies.

Institution/stakeholder	Role
Local governments	Various local government bodies at different levels, often lacking financial resources and relying on central government grants for development expenditures.
City Corporation/ Municipality/Union Parishad	Local government bodies that may provide infrastructure and regulatory support.
Trade bodies and other trade associations	Represent the interests of agri-food businesses and advocate for favourable policies.
SME Foundation	Supports the growth and development of small- and medium-sized agri-food enterprises.
Bangladesh Agro-Processors Association (BAPA)	Represents agri-food processors and advocates for their interests and growth.
Bangladesh Fruits, Vegetables & Allied Products Exporters' Association	Supports and promotes the export of fruits, vegetables, and related products.
Hortex Foundation	Works on horticulture development, which includes fruits and vegetables.
Micro Industries Development Assistance and Services (MIDAS)	Provides support and services to micro-industries, including agri-food.
NGOs and development partners	Engage in various development projects and provide assistance to agri-food communities.

▶ Annex 3. Major occupations in the five priority sectors

▶Annex Table 8. Major occupations in construction sector

Sub sectors	Occupations	Sources	Required skills	Priority level
Construction of buildings	Construction manager	Secondary	Project management, Budgeting, Scheduling, Communication, Leadership	1
	Supply chain manager	Workshop	Logistics management, Inventory control, Negotiation, Supplier relationship management	1
	Building Inspector	Secondary	Knowledge of building codes, Attention to detail, Analytical skills, Report writing	1
	Building Surveyor	Secondary	Property and construction knowledge, Measurement and valuation, Legal and planning knowledge, Problem-solving	1
	Carpenter	Primary survey and Secondary	Woodworking, Measurement and calculation, Blueprint reading, Manual dexterity	2
	Meson	Primary data and Workshop	Bricklaying, Masonry repair, Construction techniques, Precision and accuracy	2
	Painter	Primary survey and Secondary	Surface preparation, Painting and finishing techniques, Color mixing, Attention to detail	2
	Electrician (House Wiring)	Primary survey and Secondary	Electrical system knowledge, Wiring installation, Safety standards, Troubleshooting,	2
	Electrician (Installation and Maintenance)	Workshop	Electrical system knowledge, Equipment installation and maintenance, Problem-solving, Customer service	1
	Plumber	Primary survey and Secondary	Pipe system installation, Leak repair, Tool proficiency, Safety and compliance	2
	Shutterer	Workshop	Formwork installation, Concrete pouring, Safety measures, Blueprint reading	1
	Lift Installer	Workshop	Lift installation, Electrical knowledge, Mechanical skills, Safety protocols	1
Construction of roads and railways	Civil Engineers	Secondary	Engineering principles, Project management, technical design, Analytical skills	1
	Surveyor	Secondary	Land surveying, GPS and GIS systems, Data analysis, Precision measurement	1
	Geotechnical engineers	Secondary	Soil mechanics, Foundation design, Risk assessment, Problem-solving	1
	Geotechnical technicians	Workshop	Soil testing, Data collection and analysis, Technical reporting, Equipment operation	1
	Structural engineers	Secondary	Structural analysis, Design software, Material science, Construction knowledge	1
	Environmental engineers	Secondary	Environmental regulations, Sustainability practices, Waste management, Pollution control	1
	Traffic engineers	Secondary	Traffic flow analysis, Transport planning, Signal design, Safety measures,	1
Specialized Construction Activities	Pile Driver	Secondary	Pile driving, Equipment operation, Safety protocols, Physical stamina	1
	Foundation worker	Secondary	Foundation construction, Concrete pouring, Rebar installation, Safety procedures	1
	Carcass worker	Secondary	Framing and carcass construction, Tool proficiency, Blueprint reading, Measurement, and calculation	1

Sub sectors	Occupations	Sources	Required skills	Priority level
	Concrete Worker	Secondary	Concrete mixing and pouring, Finishing techniques, Formwork, Safety measures	1
	Demolition worker	Secondary	Demolition techniques, Safety protocols, Equipment operation, Debris removal	1
	Heavy Equipment Operator (Crane, Forklift, Roller, Motor Grader, Excavator, Wheel Loader)	Secondary, Workshop and KII		3
	Excavator Operator	Secondary, Workshop	Workshop, Excavation techniques, Equipment operation, Safety protocols, Site preparation	2
	Crane Forklift Operator	Secondary, Workshop	Workshop, Crane and forklift operation, Load handling, Safety standards, Communication	2
	Tile Setter	FGD, Primary survey and Secondary	Primary survey and Secondary, Tile cutting and setting, Surface preparation, Design layout, Grouting techniques	3
	Glazier	Secondary and Workshop	Glass cutting, Installation, Sealing, Blueprint reading	2
	Insulation Worker	Secondary	Insulation techniques, Material handling, Safety measures, Measurement and calculation	1
	Aluminium Fabricator	Primary survey and Secondary	Aluminium cutting, Fabrication techniques, Welding, Blueprint reading	2
	Steel Binder and Fabricator	Workshop	Steel cutting, Bending, Welding, Structural assembly	1
	Rod Bender	FGD, Primary survey and Secondary	Primary survey and Secondary, Rod bending, Reinforcement techniques, Blueprint reading, Tool operation	3
	Interior Designer	Workshop	Design principles, Space planning, Material knowledge, Client communication	1
	Casting Technician	Primary survey	Casting and molding, Material knowledge, Quality control, Safety standards	1
	Scaffolder and Form Fitter	Workshop	Scaffold erection, Formwork fitting, Safety protocols, Physical strength,	1
	CAD (2D & 3D Designer)	Workshop	CAD software, Spatial understanding, Technical drawing, Precision and detail,	1
	Duct Fitter for Air-conditioning and Ventilation	Workshop	Duct installation, HVAC knowledge, Measurement and fabrication, Safety standards,	1
	Quality controller	Primary survey	Quality assurance, Inspection techniques, Reporting, Problem-solving,	1
	Supervisor	Primary survey	Leadership, Communication, Scheduling, Conflict resolution,	1
Others	Marketing	Primary survey	Marketing strategies, Customer service, Communication, Sales techniques,	1
	Labour/worker	Primary survey	Physical labor, Tool operation, Safety practices, Task execution,	1
	Security guard	Primary survey	Security protocols, Surveillance, Emergency response, Communication,	1

Priority level 1 = Low priority; Priority level 2 = medium priority; Priority level 3 = high priority.
Note: Sourced from primary and secondary sources, and validated with sectoral stakeholders.

▶Annex Table 9. Major occupations in the tourism and hospitality sector

Sub-sectors	Occupations	Sources	Required skills	Priority
Accommodation and catering	Hotel Managers	Primary/KII	Strategic planning, Communication, Financial acumen	2
	Guest house manager	Secondary/ KII	Customer Service, Financial Management, Leadership, Organizational Skills	2
	Hotel supplies provider	Secondary	Product Knowledge, Sales Skills, Supply Chain Understanding	1
	Physical technician	Secondary	Technical Skills, Problem-Solving, Physical Fitness	1
	Housekeeping	Secondary/ Primary/KII	Organizational skills, Attention to detail, Time management	3
	Front Office Management	Secondary/ Primary/KII	Communication, Administrative skills, Problem-solving	3
	Waste Collection and Segregation	Secondary	Physical stamina, Health and safety awareness	1
	Washing and Laundry service provider	Primary	Knowledge of cleaning products and fabric care, Time management	1
	Supervisors	Primary/KII	Communication, Organizational skills, Problem-solving	2
	Public area man	Primary	Maintenance knowledge, Customer service, Surveillance and security awareness	1
	Room attendant	Primary	Customer service, Attention to detail, Time management	1
	Receptionist	Primary	Communication, Administrative skills, Multitasking	1
	AC operator	Primary	Problem-solving, Maintenance skills	1
	Dish washer	Primary	Efficiency, Knowledge of sanitation regulations	1
	Electric operator	Primary	Problem-solving, Safety compliance, technical skills,	1
	Refrigerator operator	Primary	Problem-solving, Maintenance skills	1
	Tour Guide/ echo tour guide	Secondary/Primary	Communication, People skills, Organizational skills, First aid skills, Enthusiasm	2
	Tour operator	Secondary	Digital Marketing, SEO knowledge, Content creation, Analytics, Customer service, Problem-solving, Organizational skills	1
	Ticketing and Reservation	Secondary/ Primary	Customer service, IT skills, Organizational skills	2
	Translator	Secondary	Language Proficiency, communication skills, Interpersonal skills, Cultural Understanding, Writing Skills	1
	Office management	Secondary	Organizational Skills to manage office supplies, schedule meetings, and maintain files. Communication Skills and Administrative Knowledge	1
Food and Beverage	Food and Beverage Service	Secondary/ Primary	Knowledge of food and beverage, Sales skills, Communication	2
	Manager	Secondary/ Primary/KII	Strategic planning, Communication, Financial acumen	3

Sub-sectors	Occupations	Sources	Required skills	Priority
	Cooking/Cook/Chef	Secondary/ Primary/KII	Food safety knowledge, Creativity, Time management	3
	Barista	Secondary		1
	Waiter	Primary/KII	Communication, Sales skills, Stamina	2
	Street Vendors	Secondary		1
	Catering	Secondary /Primary	Customer service, Organizational skills, Time management	2
Transportation	Local Taxi drivers	Secondary	Driving skills, Communication skills, direction of location	1
	Tuk Tuk drivers	Secondary	Driving skills, Communication skills, direction of location	1
	Rickshaw puller	Secondary/ Primary	Communication, First aid skills, Enthusiasm	2
	Bus helper	Secondary	Communication skills, direction of location	1
	Bus driver	Secondary	Driving skills, Communication skills, direction of location	1
	Cruise Ship	Secondary		1
	CNG drivers	Secondary	Driving skills, Communication skills, direction of location	1
	Compost Production	Secondary	Environmental awareness, Physical stamina	1
Entertainment	Singer	Secondary	Vocal ability, performance skills	1
	Magician	Secondary	Sleight of Hand, Showmanship	1
	Photographer	Secondary	Camera Skills, Eye for Detail	1
	Event management	Secondary	Organizational Skills, Communication Skills	1
Sports tourism	Surfing trainers	Secondary	Surfing Proficiency, Instructional Skills	1
	Para sailing operator	Secondary	Safety Knowledge, Equipment Handling	1
Common for all sub-sector	Security guard	Primary	Physical fitness, Knowledge of security protocols, Quick reflexes	1
	Sweeper	Primary	Knowledge of cleaning tools and agents, Efficiency	1
	Assistant	Primary	Communication, Organizational skills, Multitasking	1
	Cleaner	Primary	Knowledge of cleaning substances, Attention to detail, Physical stamina,	1
	Accountant	Primary	Proficiency in accounting software, Analytical skills, Attention to detail	1
	Labor	Primary	Adaptability, Basic tool and equipment knowledge	1

Priority level 1 = Low priority; Priority level 2 = medium priority; Priority level 3 = high priority.
Note: Sourced from primary and secondary sources, and validated with sectoral stakeholders.

▶Annex Table 10. Major occupations in the transport sector

Occupations	Sources	Skills required	Priority level
Electrical Installation and Maintenance	Secondary/ Primary	Knowledge of electrical systems, troubleshooting, use of tools, safety standards, and regulations	2
Fitting	Secondary/ Primary	Precision measuring, use of hand and power tools, mechanical knowledge, and interpretation of blueprints	2
Welding	Secondary	Proficiency in welding techniques, understanding of metallurgy, blueprint reading, and safety procedures.	1
Motorcycle Servicing	Secondary/ Primary	Knowledge of motorcycle mechanics, diagnostic skills, customer service, and attention to detail	2
Machine Shop Practice	Secondary/ Primary	Operation of machine tools, knowledge of materials, technical drawing interpretation, and quality control	2
Automotive Mechanics	Secondary/ Primary	Automotive repair knowledge, diagnostic skills, familiarity with electronic systems, and customer service	2
Refrigeration and Air-conditioning	Secondary	Understanding of HVAC systems, troubleshooting, and knowledge of refrigerants and environmental regulations	1
Electrical and Navigational Equipment Installation	Secondary	Technical knowledge of navigational systems, electrical skills, and understanding of marine operations	1
Heating, Ventilation, Air Conditioning (HVAC) & Refrigeration	Secondary	Knowledge of HVAC design, installation, maintenance, and regulatory compliance	1
Auto Electricity Servicing	Secondary	Electrical system diagnostics, repair skills, knowledge of automotive electronics, and computerized management systems.	1
Air Duct Servicing	Secondary	Knowledge of ventilation systems, ductwork design, and maintenance, understanding of indoor air quality standards,	1
Marine Diesel Engine Artificer Works	Secondary	Diesel engine mechanics, marine systems knowledge, and use of diagnostic equipment	1
Pipe Fitting	Secondary	Knowledge of piping systems, blueprint reading, manual dexterity, and math skills for measurements	1
Ship Piping	Secondary	Understanding of marine piping systems, reading marine engineering drawings, and knowledge of welding and fitting	1
Ship Painting	Secondary/ Primary	Surface preparation techniques, knowledge of marine paints and coatings, and understanding of corrosion protection	2
Ship Machinery Installation	Secondary	Mechanical skills, understanding of marine machinery, and ability to read technical drawings	1
Maritime Safety and Security	Secondary	Knowledge of maritime laws, safety protocols, emergency response, and security measures	1

Occupations	Sources	Skills required	Priority level
Sales Representatives	Primary	Customer service, communication skills, product knowledge, and sales techniques	1
Reservation Executive	Primary	Organizational skills, customer service, proficiency with booking software, and attention to detail	1
Office Assistant	Primary	Administrative skills, proficiency in office software, communication, and organizational skills.	1
Driver Assistant	Primary	Knowledge of vehicle operations, navigation, customer service, and basic maintenance	1
Delivery Personnel, Cashier	Primary	Time management, customer service, cash handling, and driving skills	1
Caller Personnel	Primary	Communication skills, knowledge of the transportation schedule, and customer service	1
Line Personnel	Primary	Knowledge of network distribution systems, electrical knowledge, and safety protocols	1
Driver	Primary	Driving skills, knowledge of traffic laws, route planning, and vehicle maintenance	1
Managers	Primary	Leadership, strategic planning, industry knowledge, and people management	1
Supervisors	Primary	Team leadership, problem-solving, communication, and industry-specific knowledge	1
Quality Controller	Primary	Attention to detail, knowledge of quality standards, data analysis, and reporting skills	1
Body Building Technician	Primary	Knowledge of vehicle bodywork, welding, fabrication skills, and design understanding	1
Driver Assistant, Loader	Primary	Physical fitness, knowledge of safe loading practices, and teamwork	1
Customer Care, Courierman or Messenger.	Primary	Customer service, communication, logistical planning, and record-keeping	1
Automobile Assembler	Primary	Mechanical assembly skills, use of hand and power tools, and quality inspection	1

Priority level 1 = Low priority; Priority level 2 = medium priority; Priority level 3 = high priority.
Note: Sourced from primary and secondary sources, and validated with sectoral stakeholders.

▶Annex Table 11. Major occupations in the manufacturing sector

Occupations	Source	Priority level	Required skills
Management & Supervisory Roles			
Manager	Primary	91	Leadership and motivational skills Organizational and planning abilities Understanding of business operations Knowledge of industry standards and regulations Communication and interpersonal skills Problem-solving and decision-making skills Familiarity with production processes Ability to monitor and evaluate employee performance Project management skills
Supervisor	Primary	50	
Quality Controller	Primary	38	
Sales and Marketing Executives	Primary	40	
Stock/Store Keeper	Primary	31	
Technical & Engineering Roles	Primary		
Mechanical Technician	Primary	29	Technical knowledge and training in the specific field Proficiency with industry-specific software and tools Analytical and problem-solving skills Understanding of engineering principles and mathematics Ability to read blueprints and technical documents Attention to detail and precision Project management skills Strong math and science skills
Electrical Technician	Primary	28	
Industrial Engineer	Primary	3	
Marine Engineers	Secondary	1	
Naval Architects	Secondary	1	
Artisan & Craft Roles	Primary		
Tailor and Sewing Operator	Primary	2	Manual dexterity and hand-eye coordination Creativity and an eye for design Familiarity with materials and tools of the trade Patience and attention to detail Ability to follow patterns and designs Understanding of color and texture Craft-specific skills (e.g., sewing, welding, woodworking)
Goldsmith	Primary	1	
Carpenter	Primary	1	
Handicrafts (bamboo and cane)	Secondary	1	
Block batik artists	Secondary	1	
Cutting Master	Primary	1	
Bag and Thami Maker	Primary	1	
Craftsman	Primary	1	
Operational & Production Roles	Primary		
Machine Operator	Primary	67	Ability to operate machinery and equipment Understanding of production procedures Maintenance skills for equipment Quality inspection skills Efficiency and time management Basic math and measurement skills Physical stamina and strength
Packaging Operator	Primary	51	
Assembler	Primary	28	
Printing Operator	Primary	1	
Panel Mistree	Primary	2	
Cutting Man	Primary	6	
Labor	Primary	5	

Occupations	Source	Priority level	Required skills
Filling Man	Primary	1	
Iron Man	Primary	1	
Folding Man	Primary	2	
Supporting & Auxiliary Roles	Primary		
Assistant/Helper	Primary	56	Good communication skills Organizational abilities Basic computer literacy Physical fitness and ability to handle laborious tasks For security guards, knowledge of security protocols and awareness For dispatchers, good logistical planning and coordination skills
Dispatcher/Loader	Primary	34	
Security Guard	Primary	20	
Delivery Man	Primary	2	
Waterment	Primary	1	
Line Cheaper	Primary	1	
Wearling Man	Primary	1	
Creative & Design Roles	Primary		
Designer	Primary	2	Artistic ability and creativity Proficiency with design software (e.g., Adobe Creative Suite) Knowledge of design principles and trends Ability to translate concepts into practical designs Good communication to understand client or project requirements
Graphics Designer	Primary	1	
Sales, Marketing & Finance Roles	Primary		
Cashier	Primary	1	Understanding of market trends and customer behavior Sales and negotiation skills Numeracy and money-handling skills Knowledge of financial record-keeping and tax laws Proficiency with financial software and spreadsheets Communication and customer service skills
Accountant	Primary	1	
Specialized Technical Roles	Primary		
Electronics Mechanics	Primary	1	Specialized technical knowledge in the respective field Proficiency with specific tools and machinery Detailed knowledge of safety regulations and practices Ability to read and interpret technical diagrams and blueprints
Welders	Secondary	1	
Karigor	Primary	3	
Kormoker	Primary	1	
Jacker	Primary	1	

Note: Sourced from primary and secondary sources. Please note that unlike in other sectors, there was no STED Workshop for the manufacturing sectors. As such, there was no forum for priority to be ranked on a 1–3 scale; so the priority level numbers in this table instead reflect the number of times that a particular occupation was cited by manufacturing enterprises who participated in the ESS survey (N=217).

▶Annex Table 12. Major occupations in agri-food sector

Occupations	Sources	Required skills	Priority level
Baker	Secondary/Workshop/ FGD	Baking, recipe understanding, food safety, creativity, attention to detail.	3
Food Processor and Quality Controller	Secondary/Workshop/ FGD/KII	Food processing techniques, quality assurance protocols, food safety regulations	4
Food Packaging Expert	Secondary/Workshop/ KII	Packaging design, materials knowledge, food preservation techniques, regulatory compliance	3
Refrigeration and Cooling System Operator	Secondary/Workshop/ KII	Refrigeration systems knowledge, temperature control, maintenance and repair	4
Food Safety and Hygiene specialist	Secondary	Knowledge of hygiene practices, food safety regulations, risk assessment	1
Poultry and Meat Processing specialist	Secondary	Meat cutting and processing techniques, understanding of food safety for animal products	1
Chanachur and Jhuri Processing specialist	Secondary	Specific knowledge of Chanachur and Jhuri preparation, flavoring, and packaging	1
Puffed and Flattened Rice Processing specialist	Secondary	Techniques for puffing and flattening rice, understanding of grain properties	1
Food Grain Machine Operation specialist	Secondary/FGD	Operation of grain processing machinery, maintenance, troubleshooting	2
Rice Processing specialist	Secondary	Knowledge of rice varieties, milling techniques, quality control	1
Food Preparation specialist	Secondary/FGD	Food preparation techniques, culinary skills, ingredient knowledge	2
Improved Cook Stove (ICS) Production and Installation specialist	Secondary	Knowledge of ICS technology, production methods, installation procedures	1
Organic Vegetable Production specialist	Secondary	Understanding of organic farming, soil management, crop rotation	1
Automatic Packaging specialist	Secondary	Operation of automated packaging machinery, maintenance, programming	1
Automatic Baking Operation specialist	Secondary/Workshop	Operation of automated baking equipment, process optimization, recipe scaling	2
IoT Based Biofloc Fish Farming specialist.	Secondary	Knowledge of biofloc technology, IoT devices for monitoring and control, aquaculture management	1
Fisher man	Workshop/FGD	Fishing techniques, sea navigation, equipment handling, survival skills	2
Farmer	Workshop/KII	Crop cultivation, animal husbandry, equipment operation, farm management	2
Hatcher	Workshop	Egg incubation, hatchery management, chick care	1
Seed merchandiser	Workshop/FGD	Seed variety knowledge, sales, agricultural supply chain	2
Semen producer	Workshop	Animal breeding, genetic knowledge, semen collection and storage	1
Miller	Workshop	Logistics, package handling, distribution coordination	1

Occupations	Sources	Required skills	Priority level
Sales representative	Workshop	Sales techniques, customer service, product knowledge, negotiation	1
Dealer	Workshop	Product knowledge, inventory management, sales, customer service	1
Loading/unloading man	Workshop	Physical strength, teamwork, understanding of loading techniques and safety	1
Ice provider	Workshop	Refrigeration, ice production, delivery coordination	1
Fish scales collector	Workshop	Detail orientation, collection techniques, possibly sorting and grading	1
Fish scales processor	Workshop	Processing techniques, product knowledge, quality control	1
Ready product supplier	Workshop	Logistics, inventory management, delivery systems	1
Fertilizer provider	Workshop	Knowledge of various fertilizers, soil science, sales and distribution	1
Pesticide business	Workshop/KII	Knowledge of pesticides, regulatory compliance, sales, application techniques	2
Aratdar	Workshop	Wholesale business management, negotiation, logistics	1
Medicine producer	Workshop	Pharmaceutical knowledge, quality control, compliance with health regulations	1

Note: Sourced from primary and secondary sources, and validated with sectoral stakeholders.

▶ Annex 4. Skills supply assessment methodology

Data collection overview

The table below shows the methods, tools and respondents for data collection. It also shows the frequency of data collection from different methods employed.

▶Annex Table 13. Overview of the skills supply assessment methodology

Methods	Tools	Source/Respondent	Data collection frequency
Secondary research	Literature review	BTEB Database NSDA Database Recent study reports published by the Government, ILO, and other relevant stakeholders.	n/a
Survey	Questionnaire	TVET institutes that provide technical and vocational training via formal and non-formal approaches	▶ Cox's Bazar: 36 ▶ Chattogram: 123 ▶ Rangamati, Bandarban and Khagrachari: 43 ▶ Total: 202
KIIs with labour market intermediaries	Questionnaire/ checklist	Intermediaries such as: ▶ job contractors; ▶ job matchmaking platforms; ▶ job circular publishing newspaper/portals; ▶ market linkage actors, etc.	▶ Cox's Bazar: 7 ▶ Chattogram: 3 ▶ Rangamati, Bandarban and Khagrachari: 3 ▶ **Total: 13**
Focus group discussions (FGDs)	Questionnaire/ checklist	▶ Current and former trainees (male and female) ▶ Trainers and instructors	▶ FGD with trainees: 16 ▶ FGD with trainers: 2 ▶ **Total: 18**
KIIs with regulatory authorities	Questionnaire/ checklist	▶ NSDA ▶ BTEB ▶ BMET	▶ BTEB: 7 ▶ NSDA: 2 ▶ BMET: 1 ▶ **Total: 10**

KII = key informant interview; n/a = not applicable

▶ Annex 5. List of key informants

▶Annex Table 14. Key informant interviews with labour market intermediaries

SL	Respondent	Designation	Institution	District
1	Ershad Ullah Khan	Managing Director	Sea World Manpower and Security Limited	Cox's Bazar
2	Amirul Islam Md. Rashed	District Representative	Somoyer Alo News Paper	Cox's Bazar
3	Chanchal Dash Gupta	Journalist	Cox Bangla News Paper	Cox's Bazar
4	Karim Ullah Badsha	Proprietor	M/S Aysha Construction	Cox's Bazar
5	Asma Akter	Assistant Director	Apprenticeship Office	Chattogram
6	Mr. Atik	Editor	Azadi jobs	Chattogram
7	Kamaruzzaman Sifat	Manager	The ACE Technical Institute	Chattogram
8	Shyamol Augustine Rozario	Principal	Anando Vocational Training Centre	Khagrachari
9	Morshedul Islam	Placement Officer	Bandarban TTC	Bandarban
10	Engr. Mohammad Imranul Hoque	Job Placement Officer	Rangamati TTC	Rangamati
11	Sajan Barua	Journalist	TVET-related regional News Portal	Cox's Bazar
12	Enamul Hoque	Contractor	Construction, Self-employed	Cox's Bazar

▶Annex Table 15. Key informant interviews with regulatory authorities

SL	Respondent	Designation	Institution
1	Mohammad Ali	Assistant Director	BMET, Chattogram
2	Md. Ali Akbar Khan	Chairman	BTEB
3	Prof. Md. Mamun Ul Hoque	Director (Industry & Training Co-Ordination)	BTEB
4	Mr. Jakir Hossain Howlader	Programmer	BTEB
5	Engr. Md. Faruk Reza	Curriculum Specialist (Dakhil Vocational)	BTEB
6	Md. Abdur Razzaque Mian	Curriculum Specialist (Short Course)	BTEB
7	Engr. Jannatul Ferdousy	Specialist (Research)	BTEB
8	S M Shahjahan	Deputy Director (Course Accreditation)	BTEB
9	Engr. AKM Shamsuzzaman	System Analyst	BTEB
10	Dr. Jahangir Hossain	Director (Skills Standard &Curriculum)	NSDA
11	A.M. Zahirul Islam	Specialist-4 (CS, CBC, CBLM & Assessment)	NSDA

▶ Annex 6. Overview of focus group discussions

▶Annex Table 16. Overview of focus group discussions with trainees

Region	No. of FGDs	No. of participants	
		Male	Female
Cox's Bazar	7	35	35
Chattogram	3	15	13
Rangamati	2	8	8
Bandarban	2	5	11
Khagrachari	2	8	11
Subtotal	16	71	78
Grand total		**149**	

▶Annex Table 17. Overview of focus group discussions with trainers

No. of FGDs	No. of participants	
	Male	Female
2	8	8
Total	**16**	

Skills demand and supply assessment in the Chattogram–Cox's Bazar region, Bangladesh

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ISBN 978-92-2-040631-1