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Skills Mapping for Selected Industries of Special Economic Zones: Job Creation for Unemployed Youth of Balochistan

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We examined identifying the TVET institutional framework, mapping TVET skills, and estimating the available and potential jobs creation by selected nine industries of special economic and export processing zones (SEZs/EPZs) of Balochistan. Three field visits, three focus group discussions, and 20 plus key informant interviews via mixed research methods are conducted for mapping skills about the three categories of existing, proposed, and potential industries of Balochistan. The study results show that the provincial TVET system is underdeveloped to break-even the supply and demand gaps in technical, vocational, common, and specific TVET skills. The provision of relevant TVET skills may potentially develop skilled human resources to break-even the current and futuristic jobs creation and employment opportunities for the bulge of unemployed youth of Balochistan. The study is relevant to pinpoint some policy options for skill-based human resource development endeavours in the context of ongoing industrial development proposed for SEZs/EPZs of Balochistan.

JEL Classification: J2, J21, J24, J62, O15, L00

Keywords: Employment, Industrial Development, Jobs Creation, SEZs/EPZs, Skills Mapping, Technical Skills, Vocational Skills, Youth Development

1. INTRODUCTION

The human resource development (HRD) is concerned with providing workers with the basic knowledge and expertise required for their job responsibilities in the labour market. Investment in education is considered the foremost important factor for the HRD which can ensure economic growth and development. The human capital theories (HCTs) of Becker (1964), Mincer (1974), and Schultz (1974) emphasise investment in human capital formation for personal returns, overall economic growth, and development. Both the general and technical and vocational education and training (TVET) are considered as investment in education as per insights packaged in HCTs.

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In contrast to theoretical nature of general education, the TVET is an applied version of the general education system (Khan and Ahmed, 2019; Alvarado, 2017; Silva, 2022). The Government of Pakistan announced its first-ever National TVET Policy (2015) having eight objectives for skills development across the country. For this purpose, the provincial technical and vocational training authorities (TEVTAs) are made functional to regulate, strengthen, manage, and centralise the diversified and distributed nature of TVET supply. At the national level, the National Vocational and Technical Training Commission (NAVTTC) under the Federal Ministry of Educational and Professional Training (FMEPT) is also established for commissioning the overall TVET sector in Pakistan. To ensure international best practices in the TVET sector and international acceptability of the TVET certificates and diplomas of Pakistan, NAVTTC has launched a quality framework of the National Vocational Qualification Framework (NVQF) to promote competency-based training and skills development that is in line with international standards of vocational and technical adroitness and professionalism (NAVTTC, 2020, B-TEVTA, 2020; P-TEVTA, 2021; Ahmed, et al. 2018).

Regarding jobs creation, the empirical studies of Dassel, Eckermann & Barclay (2013) and Ciżkowicz, et al. (2017) showed that millions of jobs were created in the SEZs of the Middle East, North Africa, and Poland, which provides evidence of job creation and increased employment opportunities through the establishment of SEZs. The Cambodian case of SEZs reported by War and Menon (2016) is also evidence to support the argument that industrialisation creates jobs. In this case, about 68,000 jobs for technical and vocational skilled labour were created with higher wages.

The literature suggests that the TVET skills provision mechanisms are run in line with the industrial development both in the developed and developing states of the world (Silva, 2022). For proper and effective industrial development, the role of vocational training and technical education must be empirically sorted for every new start-up of industrial development, especially in case of developing and poor regions of the world (ADB, 2014; Sudira, 2019). In addition, the occupational segregation of the labour force is also done as per the required skills in different industries (ILO, 2020). In Bangladesh, the announcement of the 100 SEZs programme got approval in its Seventh Five-Year Plan following the Bangladesh Economic Zones Act, 2010. This SEZ programme was aimed at achieving regional growth, human resource development, skills formation among unskilled labour, and the development of backward and lagging regions of the country. It was also aimed at reducing regional poverty and enhancing exports of the country. It is reported that millions of jobs are created for skilled labour force of Bangladesh and other South Asian Economies (Razzaque, et al. 2018). The Indian case of establishing SEZs also endorses technical and vocational education and training to ensure job creation, employment generation, and robust economic growth through industrial development. The SEZs Act-2005 has played an active role in building policy options for skill-based jobs creation and human resource development (Nallathiga, 2007).

In case of Pakistan, the PhD thesis of Khilji (2011) mentions that technical and human skills are necessary for jobs creation and industrial growth. The case of Pakistan for the last 60 years can be seriously investigated to know the extent and nature of skills development according to the needs of industrial development. Similarly, the literature and reports on the TVET sector of Balochistan provide no evidence that the TVET skill

provision is based on a proper categorisation of industries (Ahmed & Khan, 2019; Vision-2025, 2015). Currently, the manufacturing sector of Balochistan employs negligible (less than 2.5 percent) of provincial labour force due to lack of TVET skills provision to target industrial labour needs in Balochistan (LFS, 2017-18). Moreover, not having a TVET-based human resource policy for unemployed provincial youth may increase the chances of more unemployment, social unrest, and socio-economic miseries to likely disrupt the promise of a prosperous life for youth bulge of Balochistan (Khan and Ahmed, 2018; Ahmed and Khan, 2019).

To fill the research gap, this study will map TVET institutional set-up for skills development. Next, the study will map the industrial demand for technical, vocational, common, and specific TVET skills and will estimate job creation in selected nine industries of SEZs/EPZs in the province. This study is an attempt to map TVET skills and give policy implications for human resource planning in the context of industrial set-ups of SEZs/EPZs for the unemployed youth of Balochistan.

2. METHODOLOGY AND DATA

2.1. Research Design

The research design is composed of mixed research method and its components of focus groups discussions (FGDs), field surveys, key informant interviews (KIIs), identification of nine selected industries, identifying the provincial TVET system, and other data collection efforts following Wheeldon (2010), Williams (2007) and Khan & Ahmed (2019) for the objectives of this study.

2.2. Research Methodology

The research methodology contains two main components (i.e., a desktop survey and a field survey) and each component contains different phases. The desktop and field surveys were conducted in different phases (Wheeldon, 2010; Williams, 2007; Ahmed & Khan, 2019). The second component consists of field surveys, based on both the simultaneous and sequential phases of research methodology, of mixed research methods. These phases included three field visits to Bostan, Hub, and Gwadar SEZs/EPZs and their industrial setups. Three focus group discussions (FGDs) were also conducted for the study. Meetings with heads of departments (HoDs) for KIIs were also held.

2.3. Tools of Data Collection

Five research questions based on research objectives were used for getting information and data in three FGDs for SEZs/EPZs of Bostan, Hub, and Gwadar. For mapping the lists of different categories of TVET skills, the lists of vocational/technical and common/specific skills required by a specific industry are based on inputs from human resource offices and/or KIIs from HoDs of the selected industries. The mapping of TVET skills was also tallied with the occupational skill sets of ILO (2019), UNEVOC (2016), and NAVTTC (2019), which were confirmed by the KIs in selected industrial units. For doing so, the studies of Ahmed (2019), Khan & Ahmed (2019), ILO (2019) and UNEVOC (2016) were followed.

2.4. Respondents

The respondents of this study were key informants (KIs) from B-TEVTA, TVET departments, NAVTTC, the Board of Investment, chambers of commerce of relevant districts, GIZ, authorities of SEZs/EPZs, investors, TVET implementers, TVET institutes, TVET NGOs/INGOs for FGDs, TVET qualified individuals in labour markets.

2.5. Defining Skills for this Study

Within the broader context of skills conceptualisation, this study has divided the skills into four categories for selected industries in SEZs/EPZs of Balochistan.

2.5.1. *Vocational Skills*

Vocational skills are those skills that apply to a practical profession or work required. The duration of vocational training is from three months to twenty-four months disseminated and regularly given by TVET and allied departments in Balochistan (I&CD, 2021; NAVTTC, 2021; B-TEVTA, 2021; SWD, 2021; Subrahmanyam, 2020; Alvarado, 2017; ILO, 2001).

2.5.2. *Technical Skills*

Technical skills are those skills applied to a technical profession or work required by the selected industries of this study. The duration of technical training is from three months to five years disseminated given by TVET organissations (I&CD, 2021; NAVTTC, 2021; B-TEVTA, 2021; H&TED, 2021; UNESCO-UNEVOC, 2017; ILO, 2001).

2.5.3. *Common Skills*

Common skills are those skills that apply to generic HR and work requirements of the selected industries of this study. These types of jobs are neither vocational nor technical pertaining to skill mapping for a specific industry analysed in this study (UNESCO-UNEVOC, 2017; ILO, 2001).

2.5.4. Specific Skills

The category of specific skills is a subset of the total number of both technical and vocational skills that apply to a practical profession and/or technical jobs required by the industries selected for this study (UNESCO-UNEVOC, 2017; ILO, 2001).

2.6. Estimating TVET Skills and Skill-based Jobs Creation

Skills mapping is calculated for each industry according to the four above-mentioned categories of skills. The number of available jobs is estimated according to the skill needs of the labour force working in an industry. The average number of the required skilled labour force in each skill trade is multiplied by the number of skills required and the total number of industrial units working/functional in an industry, resulting in the estimated available jobs generated by an industry. The number of potential jobs created is estimated as the product of the number of potential industrial units to be installed in SEZs/EPZs, the number of required skills in each category, and the average number of skilled labour required for a specific industry selected for this study.

3. RESULTS AND DISCUSSIONS

3.1. Mapping TVET System of Balochistan

The TVET system of Balochistan consists of provincial and federal TVET departments, authorities, and commissions. TVET skills are supplied through both the public and private sectors' skill development institutes, which are registered, affiliated, and financed by provincial/national TVET departments, authorities, and commissions. The TVET system of Balochistan is mapped following Khan & Ahmed (2019).

3.1.1. *The Structure of Public TVET Organisations*

Mainly, there are four public sector departments, namely Colleges, Higher and Technical Education Department (CHTED), Social Welfare, special education literacy, non-formal education and human rights department (Social Welfare Department or SWD), Labour and Manpower Department (L&MPD), Commerce and Small Industries Department (C&SID), the Women Development Department (WDD), the NAVTTC regional directorate, and one partially functional B-TEVTA for the provision of TVET skills and education both for females and males in the province. It was revealed during this study that two out of the four TVET departments do not have any mechanism for the registration of the private sector TVET institutes to work for the provision of vocational and technical training in the province. However, many NGOs are registered with the SWD and working for vocational training for the vulnerable groups of imprisoned and children to a very selective and limited extent (Ahmed, 2019; FGDs, 2021; Field Surveys, 2021).

3.1.2. *The Structure of Private TVET Organisations*

There are more than three hundred institutions registered with the L&MPD for the promotion of vocational training in the province. However, more than 70 percent of these are non-functional. These institutions are working for a limited conventional training subject to getting funds and/or sponsorship by NGOs and organisations such as NAVTTC, BRSP, Mercy Corp, and UNICEF, to mention a few. These institutions are private and run by NGOs, such as community-based social organisations. They only provide vocational training in basic trades of computer and IT, beautician, tailoring and knitting, cooking, and handicrafts mostly for women. They also offer three-month basic courses in electrical, mechanical, computer and IT, and woodwork for men in rural and urban areas. However, no regular programmes for the mentioned vocational trades are run by these TVET institutions. There has been a discontinuity in the functioning of these institutions and their programmes from the time they were registered till the cancellation of their registration by the affiliate patron department (NSIS, 2019; Field Surveys, 2021; Khan and Ahmed, 2019; BRSP, 2020).

Most of the TVET skills programs are non-regular, cover very limited skills, are very generic in nature, and do not focus upon specific TVET skill requirements of the selected existing, proposed, and potential industries of Balochistan. The estimates of job creation for the unemployed youth of Balochistan as one of the prime objectives are subject to the provision of specific TVET skills, the extension of the scope of TVET skill supply related to individual labour needs, and more investment in TVET institutes for enlarging the overall provincial TVET system in Balochistan (FGD 1-2-3, 2021; Field Survey, 2021).

3.1.3. *Categorisation of Provincial Industries for Skills Mapping*

There are three types of industries identified with the help of the desktop survey, FGDs, and fieldwork conducted by the authors. These are categorised into existing, proposed, and potential industries for this study. The list of existing industries was compiled during the fieldwork and visits to provincial departments, including the I&CD. The lists were also acquired from the official records of the Small Industries Wing of I&CD of the Government of Balochistan (I&CD, 2021). The list of proposed industries was compiled from the official documents of respective SEZs/EPZs via their concerned authorities (P&D, 2021; BoI, 2021; I&CD, 2021). The list of potential industries was identified in FGDs, field visits, informal interviews, members of Chambers of Commerce, LIEDA, GIEDA, and other TVET stakeholders in the province.

3.1.4. *Selection of Industries for Skill Mapping*

The wide scope of the industrial landscape of provincial industrial set-ups for skill mapping constrained us to select a limited number of industries covering all the three industrial categories mentioned above. We have selected one industry from existing, proposed, and potential industries from each of the three SEZs/EPZs, Bostan, Gawadar, and Hub. The parameters such as TVET skill provision, TVET skill demands, job creation prospects, the functionality of the industry, TVET skills relevancy, economic importance, the availability of data, the volume of industrial set-ups, TVET supply and demand, availability of raw materials for these industries, locations of SEZs/EPZs, and many other socio-economic and industrial aspects were taken into consideration during the whole process of this exercise (Table 1; FGDs 1, 2 & 3, 2021; L&MPD; I&CD, 2021; BoI, 2021; GIEDA, 2021; LIEDA, 2021).

Thus, the three specific industries of snuff/tobacco, seafood, and shipbreaking industries are selected from the existing industrial set-ups. The food processing, steel and iron, and marble and mineral industries are taken from the category of proposed industries, and the chromite, small boat making, and fisheries/olive oil extraction industries are selected from the potential industries (FGDs 1, 2 & 3, 2021; L&MPD; I&CD, 2021; BoI, 2021; GIEDA, 2021; LIEDA, 2021; District Profiles Pishin/Lasbela/Gwadar, 2012; Field Visits, 2021; personal communications, 2021, I&CD, 2021; BoI, 2021).

Table 1

Selection of Industries for Skills Mapping

SEZ/EPZ	Existing Industry	Proposed Industry	Potential Industry
Bostan SEZ	Snuff/Tobacco	Food Processing	Chromite
Gwadar EPZ	Seafood	Steel and iron producing Industry	Small Boat Making
Hub SEZ	Shipbreaking	Marble & Mineral Grinding	Fisheries and Olive Oil Extraction

Source: I&CD, 2021; LIEDA, 2021; GIEDA, 2021; District Profiles Pishin/Gawadar/Hub, 2012; FGDs, 2021.

3.2. Tabulations and Discussion on Skills Mapping and Estimates of Jobs Creation

This section has tabulated skills mapping for the selected nine industries of the Bostan, Gawadar, and Hub industries. The estimates of available and potential jobs creation are also tabulated and described in the following way.

3.2.1. *Skills Mapping for Three Selected Existing Industries*

The data shows that total number of TVET skills for getting employment in tobacco industry are 15, including 11 vocational and 4 technical in nature, and total number of common and specific skills needed are 24, including 14 and 10 for common and specific, respectively, to create jobs in 40 units of functional tobacco units in Balochistan. For the Seafood industry of Gawadar, the total number of TVET and common and specific skills are 27 and 50, respectively. Several 14 vocational, 13 technical, 23 common and 27 specific skills are required to create jobs for unemployed youth of Balochistan. Similarly, the vocational skills shipbreaking industry of ZEZ of Hub requires 24, 27, 24, and 51 skills for vocational, technical, common, and specific categories to ensure jobs in 80 existing shipbreaking units currently in shipbreaking industry of the province (Table 2).

Table 2

Total Number of TVET Skills for Three Existing Industries

SEZ/EPZ	Industry	Units	No. Vocational Skills	No. of Technical Skills	Total No. of TVET Skills	No. Common Skills	No. of Specific Skills	Total No. of Common & Specific Skills
Bostan	Tobacco	40	11	4	15	14	10	24
Gawadar	Seafood	10	14	13	27	23	27	50
	Seafood	4	14	13	27	23	27	50
Hub	Shipbreaking	80	24	27	51	24	51	75

Source: I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; KIIs; FGDs, 2021.

3.2.2. *Skills Mapping for Three Selected Proposed Industries*

The following Table 3 shows that a total of 43 TVET skills are needed in the Food Processing industry proposed for SEZ of Bostan. Similarly, a total of 57 common and specific skills are needed to ensure jobs for unemployed youth of Balochistan in this

Table 3

Total Number of TVET Skills for Three Proposed Industries

SEZ/EPZ	Industry	Units	No. Vocational Skills	No. of Technical Skills	Total No. of TVET Skills	No. of Common Skills	No. of Specific Skills	Total No. of Common & Specific Skills
Bostan	Food Processing	4	15	24	43	31	26	57
Gawadar	Steel/Iron	13	17	35	52	29	34	63
Hub	Marble & Mineral	250	26	35	61	25	37	62

Source: LIDA, 2021; GIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Survey, 2021; FGDs, 2021.

industry. Most of the skills are common, followed by specific, vocational, and technical respectively for this industry. The skills for the steel and iron industry are mostly technical and specific for proposed industry on SEZ of Gawadar. The proposed industry of marble and mineral, mostly located in SEZ of Hub, requires 26 vocational skills, 35 technical, 25 common, and 37 specific skills to create jobs for unemployed youth of Balochistan.

3.2.3. *Skills Mapping for Three Selected Proposed Industries*

The skills mapping data of three potential industries elaborates somehow extensive number of skills in SEZs/EPZs of Gawadar and Hub. As both the SEZs/EPZs two rows specific to their respective industries. The Chromite industry is highly technical, and 130 total numbers of skills are required to get jobs in these SEZs/EPZs of Bostan and Hub. However, the EPZs/SEZs of Hub and Gawadar share 57 total skills required for getting jobs in fisheries and olive oil industrial units. The details of all the TVET and common and specific skills for these industries are given below (Table 4).

Table 4

Total Number of TVET Skills for Three Potential Industries

SEZ/EPZ	Industry	Units	No. Vocational Skills	No. of Technical Skills	Total No. of TVET Skills	No. Common Skills	No. of Specific Skills	Total No. of Common & Specific Skills
Bostan	Chromite	7	19	28	47	64	66	130
Gawadar	Small Boat Making	22	15	20	35	23	35	58
	Fisheries/Olive-Oil	5	15	30	45	18	39	57
Hub	Chromite	4	19	28	47	64	66	130
	Fisheries/Olive-Oil	9	15	30	45	18	39	57

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

3.2.4. *Estimated Number of Job Creation by the Snuff/Tobacco Industry*

The study assumed that at least two skilled labours are hired to work in a snuff/tobacco factory in Pishin (Field Survey, 2021). There are 24 categories of jobs available in a functional snuff/tobacco factory, out of which 15 jobs are based on TVET skills. Therefore, 15 TVET skilled labour out of 48 (=24x2) total hired labour force are needed for the snuff/tobacco factory to work functionally. The total labour demand side reflects 48 job opportunities in overall employment and 30 job opportunities for TVET skills-based employment in a snuff/tobacco factory in Pishin (Field Survey, 2021). The data of existing industries showed that there are 40 units of snuff/tobacco factories in the province, thus, the total number of jobs created by snuff/tobacco industries was estimated to be 1,920 (=40x48) for youth in Balochistan. The TVET-based jobs created were approximately 1,440 (=30x48) by the 40 snuff/tobacco factories in Balochistan (I&CD, 2021; Field Survey, 2021). Notwithstanding, the potential job creation in the snuff/tobacco industry depends upon the potential number of snuff/tobacco factories to be installed in this industry. The study identified the potential for approximately 1000

snuff/tobacco factories in the province (FGDs 1 & 2; Field Survey, 2021). Thus, the provincial snuff/tobacco industry alone could create approximately 48,000 jobs (=48x1000) including 30,000 (=30x1000) TVET skilled jobs for the unemployed youth of Balochistan (authors' calculations, 2021).

3.2.5. *Estimated Number of Job Creation in the Seafood Industry*

On average one skilled labour was hired to work in a seafood industrial unit in Gwadar and Hub areas of Balochistan. So, for 14 seafood industrial units reportedly functional in the Gwadar and Hub industrial zones of the province (Table 5; Field Survey, 2021; I&CD, 2021; Personal Communication, 2021), the available jobs in a functional unit were 27 and 50 for vocational/technical and common/specific categories, respectively. There are approximately 14 small seafood units in Gwadar and Hub industrial areas. The total number of jobs generated by 14 seafood enterprises was estimated to be 700 (= 14x50) for all the TVET skills. Similarly, the TVET skill-based jobs of 378 (= 14x27) were available for seafood-related skills holders in the 14 seafood industrial units in the province. More jobs can be created if this very local seafood industry is prioritised in terms of TVET skill policy formulation and its implementations to create jobs for the unskilled youth of the 600 km coastal area of Balochistan (FGD 1,2 &3, 2021; Field Survey, 2021; I&CD, 2021). Potential job creation depends upon the potential of seafood production along the 600 km long coastal areas of Balochistan. This long coastal area, full of seafood products and species can be used for the establishment of potential seafood industry in SEZs/EPZs of Balochistan. The study's results indicate that approximately more than 200 seafood enterprises may create jobs for approximately 10,000 (=50x200), out of which 5,400 (=27x200) are TVET skill-based jobs.

3.2.6. *Estimated Job Creation in the Shipbreaking Industry*

Similarly, three to four skilled labours are necessary to work in a functional shipbreaking unit located in Gadani near Hub areas of Balochistan. The data show that there were around 80 ships scrapped from 2018 to 2020 in the Gadani coastal area of Balochistan (FGDs 2 & 3, 2021; Personal Communication, 2021; Field Survey, 2021). The estimates of available jobs in a shipbreaking unit were 51 and 75 in vocational/technical and common/specific skills categories, respectively. Since approximately 80 ships were broken and scrapped, the average employment created in 2020 by a single shipbreaking industry was 240 (=80x3) in Balochistan (Field Survey, 2021). The total number of jobs created by scrapping 80 ships in 2020 was around 18,000 (= 240x75), including 12,240 (= 240x51) TVET-based jobs with skills relevant to the shipbreaking industry. Most of the jobs required both technical and vocational skills. The potential job creation in the shipbreaking industry depends upon the implementation of safety rules for labours, promoting the shipbreaking industry, and providing relevant TVET skills. The study estimated that there is a potential of scrapping and breaking 150 ships per year in Balochistan (FGDs 1 & 2; Field Survey, 2021). Thus, the provincial shipbreaking industry could create 33,750 (=3x75x150) jobs, including 22,950 (=3x51x150) TVET-based jobs, based on average job creation of 225 (=3x75) when a ship is scrapped and broken (authors' calculations, 2021; (FGDs 1, 2, & 3; 2021; Field Survey, 2021; Lasbela Chamber of Commerce, 2021).

Table 5

Estimates of Jobs Creation by Three Selected Proposed Industries

SEZ/EPZ	Industry	Total Skills	TVET Skills	Available Jobs/ Skill	Units		Available Jobs		Potential Jobs Creation	
					Existing	Potential	Total Jobs	TVET Jobs	Total Jobs	TVET Jobs
Bostan	Food Processing	57	43	1	4	1000	228	172	57000	43000
Gawadar Hub	Steel/Iron	63	52	4	13	120	3276	2704	30240	24960
	Marble & Mineral	62	61	3	250	1500	46000	45750	279000	274500

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

3.2.7. *Estimated Job Creation in the Food Processing Industry*

There were 4 food processing units working mostly located in the Quetta industrial zones of the province (Tables 5; Field Survey, 2021; I&CD, 2021; Personal Communication, 2021). The available jobs in a functional food processing industry were 43 (=43x1) and 57 (=57x1), on average of one job per skills, in vocational/technical and common/specific categories. The total number of jobs created by 4 food processing units was estimated at around 172 (= 4x43) for the TVET-skilled labour force and 228 (=57x4) for the overall skilled and unskilled labour force of the province (Field Survey, 2021). However, more jobs can be created if the food processing industry techniques via TVET training are taught in TVET institutes (FGD 1 & 2, 2021; Field Survey, 2021; I&CD, 2021). Thus, the provincial food processing industry could create potential jobs for approximately 57,000 workers (=57x1000), including 43,000 (=43x1000) TVET-based jobs. However, the job creation potential of this sector depends upon many factors including the provision of relevant TVET skills required by the food processing industry (FGDs 1 & 2; Field Survey, 2021; authors' calculations, 2021).

3.2.8. *Estimated Number of Job Creation in the Steel Industry*

The study's estimates suggest that, on average, four to five skilled labours are hired to work in a functional steel production unit. There are a total of 13 steel production units and that has created a total of 208 (=52x4) jobs for vocational/technical skilled labour force and 252 (=63x4) jobs for common/specific categories of skills qualifications. The total number of employment opportunities created by 13 steel/iron producing mills/units was estimated to be around 2,707 (= 13x208) for vocational/technical skilled labour force and 3,276 (=13x252) for common/specific categories of skills requirements. The statistics and field survey observations show that most of the jobs were highly advanced in vocational or technical terms of job responsibilities for the steel/iron mills workers. The potential job creation in the steel/iron industry depends upon the potential number of steel mills to be installed in SEZs/EPZs of Balochistan. The study estimates that there is a potential of approximately 120 steel/iron producing units/mills (FGDs 1, 2 & 3; 2021; Field Survey, 2021). Thus, the provincial steel and iron producing industry can potentially create30,240 (=120x4x63) jobs for the skilled and unskilled labour force and 24,960 (=120x4x52) skilled labour force, based on average job creation of 845 by a functional steel/iron mill. However, the job creation potential of this sector depends upon

many factors including the provision of relevant TVET skills demanded by the steel and iron producing industry (authors' calculations, 2021; FGDs 1 & 3, 2021; Field Survey, 2021; I&CD, 2021).

3.2.9. *Estimated Number of Job Creation in the Marble/Grinding Industry*

The estimates of available jobs in a functional marble/mine grinding factory were 61 and 62 vocational/technical workers and common/specific workers, respectively (Table 5). Since there are approximately 250 marble/mine grinding factories in areas near SEZs of Bostan and Hub, the average employment created by a functional marble/mine grinding factory for the skilled labour force was estimated to be 181 (=3x61), on average 3 jobs/skill, for the skilled category and 186 (3x62) for both the skilled and unskilled workers categories in Quetta and Hub industrial zones (Field Survey, 2021). The total number of available jobs or employment opportunities created by 250 marble/mine grinding units was estimated to be around 45,750 (= 250x181) for TVET skill holders and the estimated number of jobs for all the skilled and unskilled workers in the industry was estimated to be 46,500 (= 250x186). The estimates of potential job creation in the marble/mineral grinding industry depend upon the potential number of marble/mine grinding factories to be installed in SEZs/EPZs of Balochistan. According to the study's estimation, approximately 1,500 marble/mine grinding factories can be set up based on the estimates of 300 billion tons of marble reserves in Balochistan and KPK and the export share of 90 percent in overall exports of marble from Balochistan to almost 52 countries worldwide (FGDs 1 2 & 3, 2021; Field Survey, 2021; Keerio & Abden, 2017; Malkani & Mahmood, 2017; Mohammad, 2016). Thus, the provincial marble/mineral grinding industry could create approximately 274,500 (=181x1500) and 279,000 (=186x1500) jobs for the required TVET skill holders and overall labour force, respectively for unemployed youth of Balochistan. However, the job creation potential of this sector depends upon many factors including the provision of relevant TVET skills relevant to the skills demanded in the marble/mineral grinding industry (authors' calculations, 2021).

Table 6

Estimates of Jobs Creation by Three Selected Existing Industries

					Units		Available Jobs		Potential Jobs Creation	
SEZ/EPZ	Industry	Total Skills	TVET Skills	Available Jobs/Skill	Existing	Potential	Total Jobs	TVET Jobs	Total Jobs	TVET Jobs
Bostan	Tobacco	24	15	2	40	1000	1920	1440	48000	30000
Gawadar	Seafood	50	27	1	14	200	700	378	10000	5400
Hub	Shipbreaking	75	51	3	80	150	18000	12240	33750	22950

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

3.2.10. *Estimated Number of Job Creation in the Chromite Industry*

The study's estimates show that, on average, two to three skilled labours were hired to work in a functional chromite processing unit located in the Muslimbagh and Wadh (Khuzdar) areas of Balochistan. There are a total of 11 chromite processing units working in areas near the SEZs in Bostan and Hub (Table, 7; Field Survey, 2021; I&CD,

2021; Personal Communication, 2021). The estimates of available jobs in functional chromite processing units were 47 and 130 in vocational/technical and common/specific categories of skills trades requirements, respectively. So, 11 chromite processing units in Hub and Bostan industrial areas may create 33 (=11x3) jobs in both Bostan and Hub (Field Survey, 2021). The total number of available jobs in 11 chromite processing units was estimated to be 1,551 (=11x3x47) for vocational/technical skill holders and 4,290 (=11x3x130) for the common/specific skilled labour force. The statistics and field survey observations show that most of the jobs were highly advanced in vocational or technical terms in the chromite processing industry. The results of the study show that approximately 100 to 120 chromite processing units can be established in the region (FGDs 1 & 3, 2021; Field Survey, 2021). Thus, the provincial chromite industry can potentially create approximately 14,100 jobs (=100x3x47) in the technical/vocational category and 130,300 (=100x3x130) jobs in the common/specific category for unemployed youth of Balochistan. However, the job creation potential of this sector depends upon factors such as the provision of relevant TVET skills to the provincial labour force of Balochistan that is demanded by the chromite processing industry (FGD 1 & 3, 2021; Field Survey, 2021; I&CD, 2021; Authors' Calculations, 2021).

3.2.11. *Estimated Number of Job Creation in the Boat-making Industry*

There was a total of 22 boat-making manufacturing units in Gwadar and Hub areas estimated during the fieldwork of this study (Table, 7; Field Survey, 2021; GIEDA, 2021; Personal Communication, 2021). The estimates of available jobs in a functional boat-making unit were 35 and 58 in vocational/technical and common/specific skill categories, respectively. So, for 22 small boat-making units, the average employment created is estimated to be around 70 (=35x2) and 116 (=58x2) for vocational/technical and common/specific TVET skilled labour force, respectively (Field Survey, 2021). Plus, an approximate number of total employment created by these units was around 1,540 (=22x35) in the vocational/technical category and 2,552 (=22x116) in the common/specific TVET skills category. Potential job creation in the small boat-making industry depends upon the potential number of boat manufacturing units to be installed in SEZs/EPZs of Balochistan. The estimations show that approximately 100 small boat-making manufacturing units can be established (FGDs 1 2 & 3, 2021; Field Survey, 2021). Thus, the small boat-making industry could create jobs for approximately 7,000 (=70x100) and 11,600 (=116x100) for the vocational/technical and common/specific TVET skilled labour force, respectively. However, the job creation potential of this sector depends upon many factors including the provision of relevant TVET skills pertaining to the skill demands of small boat-making and relevant trades of this industry to create employment opportunities for the provincial labour force of Balochistan (FGD 1, 2 & 3, 2021; Field Survey, 2021; I&CD, 2021; Authors' Calculations, 2021).

3.2.12. *Estimated Number of Job Creation in Fisheries/Olive-Oil Extraction Industry*

The estimates of available jobs in a functional fisheries/olive oil extraction unit were 90 (=45x2) and 114 (=57x2), based on 2 average job/skill available, for vocational/technical and common/specific skill categories, respectively, for a functional fishery and/or olive oil extraction unit in Gwadar, Winder, and Hub areas

of Balochistan. There were total of 14 (5+9) fisheries/olive oil extraction units working in areas near the SEZs of Gwadar and Hub (Table, 7; Field Survey, 2021; I&CD, 2021; Fisheries Department, 2021; Agriculture Department, 2021; Personal Communication, 2021). The total number of employment opportunities and available jobs respectively for vocational/technical and common/specific categories of the skilled labour force was 1,260 (=90x14) and 1,596 (114x14), created by 14 fisheries/olive-oil extraction units in the province (authors' calculation, 2021). The field survey observations and FGDs showed that most of the jobs were advanced in vocational, technical, and specific skills. The estimates of potential job creation in the fisheries/olive oil extraction industry depend upon the potential number of fisheries/olive oil extraction units to be installed around the sea areas and olive oil extraction fields. The results of the study show approximately 150 fisheries units and 100 olive oil extraction units (FGDs 1 & 2; Field Survey, 2021). Thus, the estimates of potential job creation by the fisheries and olive oil extraction industry were 13,500 (90x150) and 17,100 (114x150) for skilled labour (Authors' Calculations, 2021; C&SID, 2021; GIEDA, 2021).

Table 7

Estimates of Jobs Creation by Three Selected Potential Industries

				Available	Units		Available Jobs		Potential Jobs Creation	
SEZ/EPZ	Industry	Total Skills	TVET Skills	Jobs/ Skill	Existing	Potential	Total Jobs	TVET Jobs	Total Jobs	TVET Jobs
Bostan	Chromite	130	47	3	11	100	4290	1551	130300	14100
Gawadar	Small boat Making	58	35	2	22	100	2552	1540	11600	7000
Hub	Fisheries Olive-oil	57	45	2	14	150	1596	1260	17100	13500

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

4. CONCLUSION AND POLICY RECOMMENDATIONS

4.1. Conclusion

The study mapped TVET skills for the categories of vocational, technical, common, and specific skills for the selected nine industries from among the categories of existing, proposed, and potential industrial set-ups to be established in the three SEZs/EPZs of Bostan, Hub and Gwadar in Balochistan. Four types of TVET skills are listed in numbers for each of the nine selected industries for this study. The study has also mapped the TVET institutional framework to show supply TVET side for the youth of Balochistan, in general, but not specific to meet the labour market needs of the selected nine industries in SEZs/EPZs of Balochistan. The study also estimated the available and potential numbers of jobs creation for employment opportunities created by these selected industries. The under-developed and vague picture TVET skill mapping for industrial development may likely put forth its case for the following policy implications.

4.2. Expected Policy Implications

The following policy implications may likely guide the policy process for effective skills development to ensure job creation for the unemployed youth of Balochistan.

(1) A well-coordinated and comprehensive TVET framework should be devised to include all the supply-side and demand-driven aspects of skill formation for industrial development in SEZs/EPZs of Balochistan.
(2) There is a strong need for coordination and alignment of B-TEVTA with allied provincial TVET departments that should work collectively to reduce the existing skill deficiencies of the provincial labour force.
(3) The recognition and functionality of B-TEVTA as per the B-TEVTA Act of 2011 should be mandated for regulation, execution, and skill development in the province.
(4) The linkages between TVET institutes and industries are strongly recommended to fill the skill gaps to ensure employable opportunities for the provincial labour force.
(5) The study finally recommends human resource planning based on TVET skills required by the industries of SEZs/EPZs to ensure job creation, decent work, and livelihood for the unemployed youth in the industrial setups of SEZs/EPZs of Balochistan.

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