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Identification of Relevant  
Technical & Vocational  
Skills for Job Growth and  
Human Resource Development  
in the Context of CPEC  
Projects for Baluchistan

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**Job Growth & Human Resource Development Divison**

**“Identification of Relevant Technical & Vocational Skills for Job Growth & Human Resource Development in the Context of CPEC Projects for Baluchistan”**

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## **1. Introduction**

Identification of relevant trades/skills, in technical vocational education and trainings (TVET), for the need of prospective CPEC projects, both in short and long terms, are necessary for devising optimal human resource policies for job growth and economic development of all provinces of Pakistan. Baluchistan is the least developed province of Pakistan and its socio-economic development requires focused and objective based policy options under CPEC for skill development, job growth, and human resource development. The system of TVET is not yet explored to know if it fulfills the demand for skills for job growth and human resource development under the prospective CPEC projects in the province. Conventional TVET trades/skills, overlapping of TVET trades/skills provision by different public-sector departments, non-functional status of B-TEVTA, low coordination level among different departments for TVET provision, low skill levels, poverty, insurgency, and other low levels of socio-economic indicators are serious issues to pause the provision and development of relevant TVET trades/skills required for yielding the benefits of prospective CPEC projects in the province. Identification of relevant TVET trades/skills will probably help in devising right policy options, generating more employment opportunities, treatment for skill mismatch, job growth, and human resource development in different sectors of this backward province. Right policy options are not only desirable for the overall socio-economic development of this province but also for the development of positive narration on overall CPEC project in the minds of common people of Baluchistan.

There are 12 CPEC projects to be launched for Gwadar in Baluchistan. These include Gwadar East-Bay Expressway, Gwadar International Airport, Construction of Breakwaters, dredging of berthing areas & channels, Development of Free Zone, Technical and Vocational Institute at Gwadar, and some other projects to cost more than US \$ 1000 million for the development of Gwadar mega projects for socio-economic development of Baluchistan, in particular, and Pakistan, in general. Similarly, CPEC projects in infrastructure, energy, and other sectors of the provincial economy have strong likelihood to boost the standards of living of common people of Baluchistan to promote their livelihoods and socio-economic uplift to enjoy a better quality of life.

Due to low endowment of educational and skill development of the people of Baluchistan, the political economy of CPEC may not yield due shares to its common people. Vision-2025 of government of Pakistan suggests investing in people for their education and skill development on gender parity basis for the provinces. It is necessary to equip people of Baluchistan with necessary and market demanded skills to ensure employment and other economic fortunes in the wake of CPEC projects in the province. TVET system in Baluchistan is comparatively lagged behind for job growth and human resource development in both the technical and vocational skill trades as compared to the TVET system and skill development in other provinces of Pakistan (Ahmed & Khan, 2018).

This research study is designed to focus upon identifying relevant TVET trades/skills in which the province must build the capacity for the provision of relevant TVET trades/skills for proposed CPEC projects and prospective economic activities once get started. It will also serve to give directions for identifying and knowing the extent and nature of skill requirements for medium and long terms CPEC projects and its based labor markets needs in future. The results of this identification study are expected to give directions for policy makers, B-TEVTA, provincial departments working for TVET provision, Chinese investors, unemployed young segment of the province, business community, and other stakeholders to work for the betterment and overall socio-economic development of this backward province of Baluchistan.

The scheme of the study comprises of separate sections each for brief literature review, objectives for the study, research methodology, discussions on each objective, and conclusion and policy recommendations for identification of relevant TVET skills for job growth and human resource development in the context of CPEC projects of Baluchistan.

## **2. Literature Review**

Right policy for human resource development plays an important role for economic growth and development. Mello (2008) and (Heckman, Lochner, & Todd, 2003, 2006, 2008) identify the role of skilled and educated labor contributing for overall economic growth among the countries. Human capital theory recognizes investment in schooling and health important for private and social returns (Schultz, 1961). Becker (1964) differentiated between general and specific trainings and its costs and returns for investment in human to highlight the importance of human

capital formation for getting economic benefits of growth and development. Investment in general schooling and TVET are both considered important for human capital formation under the assumptions of human capital theory. A balanced approach of importance to both the general schooling and skill development in any human resource development policy will ultimately lead an economy towards higher economic growth and development (UNESCO-UNEVOC, 2016).

Path breaking work of Mincerian wage equation (Mincer, 1974) gives empirical evidence to the basic relationship between years of schooling and wage earnings for labor force of USA and the results of positive nexus gave birth to avenue for discussion hitherto in the field of labor economics and economics of education. Heckman et al. (2003) thoroughly discussed that schooling and skill knowledge contribute not only for earnings differentials but also for devising right policy options for human capital formation through the inculcation of both the cognitive and non-cognitive attributes in people via schooling.

TVET is known for increasing the profitability to producers, yielding wage returns and employment opportunities to skilled individuals and overall economic growth for countries like Pakistan (Kazmi, 2007). Mustafa, Abbas, Saeed, and Anwar (2005) highlighted the relationship between variability in skill development and economic growth for the case of Pakistan and the relation evidenced significant correlation in their study. Khilji, Kakar, and Subhan (2012) and Khan, Akhtar, Mehmood, and Muhmood (2013) mentioned the case of Pakistan in comparison with other South Asian economies as less competitive and less globally integrated in terms of trade, finance, and other economic sectors due to low levels of human capital development and skill development among many other major macroeconomic indicators. Literature reveals that TVET at each provincial level and its comparison among the provinces have not been discussed for assessing socio-economic impact of TVET in Pakistan. Only two studies are mentioned in literature by Ahmed and Khan (2018) and Ahmed and Muhammad (2017) and concludes that TVET system in Baluchistan is deplorable to meet the skill needs of CPECT projects in Baluchistan. The job growth for the youth of Baluchistan may not materialize if human resource is not developed on emergency basis for most of the CPEC projects in Baluchistan. Lack of literature suggests for proper and scientific studies at provincial levels, for each province or/and comparing the provinces, to critically explore TVET systems for designing recommendations of effective policy options for job growth and human resource development in this regard.

There are twelve (12) CPEC projects proposed to be started in Baluchistan. It is hoped that these projects will change the lives of the people living in Baluchistan. Marginalized people of the province will get due returns from these projects. Most of the economic sectors, that is, agriculture, industry, services, commerce, seaports, Gwadar port, and the public and private sectors will be benefited socio-economically from the outputs of these projects. Chinese and other foreign investors will invest in unexplored and resource rich sectors of Baluchistan for the prosperity and economic development of this province (Planning Commission, 2016; GoP, 2018).

The likelihood of getting better share and acquiring socio-economic development from most of economic activities and projects relies upon human resource and skill development in economies. The current scenario of low levels of education and skill deficiency in Baluchistan are major challenges to threaten potentially the overall development in Baluchistan (GoB, 2015). Skill levels and human resource development in Baluchistan seems not up to the mark to compete with highly skilled labor of other province and Chinese labors in labor markets that could emerge in the wake of generated economic activities of CPEC projects. Job growth for the people of Baluchistan may not be materialized as per requirements for uplifting their socio-economic development due to weak position of human resource development in the province.

The provincial capacity for designing right and effective policies for human resource and skill development are yet to be made or designed for job growth in the wake of CPEC projects. The provincial government, with the help of its departments of Planning and Development, B-TEVTA, and other TVET departments, has identified the need of skill development and provision to the people of Baluchistan for CPEC projects. These effective policies are also necessary to get local people integrated with the proposed CPEC projects and ensuring due shares of socio-economic prospects, job growth, and employment generation for them. The federal government also consider human resource development and skill provisions policy as an integral part of the overall set of policy options designed for CPEC and its projects in the province (Balochistan, 2011; GoB, 2015; NAVTTC, 2016).

NAVTTC (2018) reports skill development for Baluchistan in the lowest categories of TVET enrollment, TVET pass outs, TVET institutions, number of TVET skill trades, and overall skill development. Most of the TVET skills are conventional and not specifically provided as per the

expected needs and requirements of CPEC projects in the provinces. Even, TVET skill relevancy to CPEC projects is not identified by any federal or provincial TVET authority, department, and other bodies. The probability of low development persistency and backwardness of people in every walk of CPEC generated socio-economic activity may prevail if the people of the province are not provided with relevant TVET skills in the province. B-TEVTA has, as yet, not publicly announced a policy for TVET development in the province to convince related and allied departments to work under the official umbrella for the development of skills to the unskilled people of Baluchistan as P-TEVTA does in the province of Punjab (Balochistan, 2011; NAVTTC, 2016; P-TEVTA, 2018).

This research project has steered in the milieu of deficiency of proper and right human resource development policy, specifically, identification of relevant TVET skills for job growth and human resource development in the context of CPEC projects for Baluchistan. The study will give directions for devising right TVET policy for the least developed province of Baluchistan.

### **3. Objectives of the Study**

1. To give a snapshot of the existing TVET system for skill development in the province and identifying its scope and role for the provision of CPEC relevant TVET trades/skills in the province.
2. To introduce the provincial economic corridors and direction identification for its TVET provision.
3. To identify relevant TVET trades/skills for the select economic sectors of the province.
4. To identify relevant TVET trades/skills for selected proposed CPEC projects of Baluchistan.
5. To recommend policy options for the introduction of relevant TVET skills for job growth and human resource development in the context of CPEC projects for uplifting socio-economic development of Baluchistan.

### **4. Research Methodology**

Methodology for this study is comprised of the following surveys.

**4.1. Desktop Survey:** It includes desktop survey and review of literature in detail. Research articles, TVET official reports, online TVET related materials, books readings about TVET, TVET periodicals, and web pages and web portals of TVET departments, institutions, and other bodies are consulted thoroughly and purposively for giving research context, right directions, and proper insight to proceed further the remaining steps for successful completion of this relevant study to CPEC projects about Baluchistan.

**4.2. Field Survey:** It includes the following phases.

**Phase 1.** It includes extensive field work/survey in multiple visits to TVET related departments and institutions, both at provincial and federal levels, informal discussions and meetings with TVET authorities and subject matter experts for discussions on the subject matter and scope of this research work for the case of relevant skills in the context of Baluchistan. Informal discussions include meetings with directors of four TVET related departments of provincial government, B-TEVTA, NAVTTC, two principals of polytechnic colleges, HODs of technical and vocational centers, TVET trainers, TVET qualified individuals, some of the subject matter experts, and project authorities of some of the select CPEC projects launched in the province. Around 30 plus individuals are consulted in this phase throughout Baluchistan. This phase updated the author for the context of relevant TVET skills and further steps ahead to formally complete the project.

**Phase 2.** It includes the identification of relevant TVET trades/skills provision and expected demand and skill requirements with which CPEC projects of the province are directly and indirectly related. Similarly, this phase is reserved for identifications of relevant trades/skills and its needs for some of the select sectors like, agriculture, mines and minerals, construction, special economic zones, and B-TEVTA proposed TVET skills for the province.

**5. Procedure for Identification of Relevant TVET Skills:** It contains the following ways of skill identification for the CPEC projects and the select economic sectors of the province.

**5.1.** Provision of all the TVET skills by provincial TVET departments is consulted to know the context and capacity of relevant TVET trades for CPEC projects.

- 5.2. Skill needs, assessment, and identifications are sought out and listed from the TVET experts mentioned in Phase 1 of research methodology.
- 5.3. The select economic sectors are identified in which the province has potential for economic development. Relevant skill trades are sorted out from TVET departments, list of skill trades by UNESCO, and internet sources available for the same sectors mostly related to Pakistan. The skill trades are rectified from the HODs and subject matter experts of the same economic sectors. The skill trades are also tallied with NAVTTC list of TVET trade skills for its “Skilling Pakistan” program. At the end, sector wise relevant TVET trades skills are enlisted for this study.
- 5.4. Since, there are 12 CPEC projects proposed by national sources of CPEC projects in the province. Relevant TVET skill trades are sorted out from TVET departments, list of skill trades by UNESCO, and internet sources for each CPEC project in accordance with availability of TVET skill trades officially proposed and recognized for the like sectors in other economies of the world. For instance, for Gwadar Deep Sea Port, the list of skill trades of Dubai Sea Port is taken as a starting point for identification. The skill trades in the list are then rectified from HODs and subject matter experts associated with the same CPEC project, authorities of NAVTTC, and B-TEVTA. The rectified list of relevant TVET skill trades are also tallied with TVET lists of B-TEVTA and NAVTTC for job growth and human resource development in the context of Baluchistan.
6. **Discussions on Each Objective of the Study:** Discussions are arranged in the context of set objectives one by one in the following manner.

**Objective # 1. Existing TVET Mechanism in the Province: Scope and Relevancy:** It comprises of public and private TVET skill provision in the province.

**Public Sector Provision of TVET in Baluchistan:** Mainly, there are four public sector departments, one TVET authority, and one regional directorate of NAVTTC is established for the provision of TVET skills and education in the province.

**Department of Higher and Technical Education:** The technical education directorate of this TVET department disseminates polytechnic based diplomas and certificates in nine (9) associate engineering technologies in the province. It is aimed at educating people of the province with poly and mono skills and technics.

**Social Welfare Department:** It works for women and vulnerable segments of the population to enhance their status with active participation based on skill provision, training opportunities, community development both in rural and urban areas in the province. It has established more than 100 rural and urban development centers throughout Baluchistan for three months skill provisions in three to four TVET trades of computer, handicrafts, tailoring, and dress designing.

**Labor & Manpower Department:** It is one of the main departments for training and development of manpower, and preparing skilled labor for the labor markets of the province. It has established technical and vocational training centers mostly in divisional headquarters of the province for around 25 plus TVET skill trades to train young segment of the rural and urban population.

**Industries & Commerce Department:** It is assigned under one of the official ordinances for the dissemination of skills necessary for the industries of carpets, handlooms, handicrafts, and fisheries to the unskilled people. Small industries wing of this department works for these conventional types of skill trades provisions at every divisional headquarters of the province.

**BTEVTA:** It is established as an authority to bring the allied TVET related departments (mentioned above) under one umbrella for better organization of skill provisions to the unskilled population of the province. It is partially recognized by the some of the allied departments due to administrative, legal, and collaborative issues from the part of general roles and administration among the these TVET departments under the official document of Rules of Business (2011) of government of Baluchistan and pending decisions for administrative settlements B-TEVTA and the mentioned TVET departments (GoB, 2011).

**Private Sector Provision (NGOs & Informal Apprenticeship) of TVET:** There are many NGOs, NPOs, & other organizations responsible for the provision of TVET in the province. These private sectors TVET institutions are registered and affiliated with NAVTTC and the above mentioned TVET departments for skill dissemination. Around 300 plus institutions are registered with Labor & Manpower Department but most of them are non-functional. The functionality of these private sector institutions relies upon fund availability from donors and in the time of fund hunting and winning financial sponsorship from TVET projects and donors for the provision of TVET skills in the province. Other departments have no such sponsorship like

activities for private sector to work for TVET provision. BTEVTA has also not yet started to work for private sector for TVET provision due to financial & capacity constraints. NAVTTC has given around 200 plus private institutions the projects of Prime Minister's "*Youth Skill Development Program*" for Skilling Pakistan in the last four phases of skill development in the province.

**Capacity of Relevant TVET Skills for CPEC Projects:** Up till now, as per official rules, policies, documents and reports, none of the TVET departments and authorities has identified and enlisted relevant TVET skill program(s) designed for job growth and human resource development in the context of CPEC projects in the province. The following tables show this deficiency of skill provisions in the province.

**Department wise Distribution of Public & Private Sector TVET Institutions:** The table-1 shows a snapshot of the TVET institutions working for the provision of TVET in the province. Due to partially and non-functionality of most of these institutions, TVET departments have to work of identification, introduction, and dissemination of relevant TVET skills for the upcoming CPEC projects in the province.

**District wise Provision of TVET Trades:** The following table-2 indicates that TVET trade distribution across all the districts of Baluchistan is not uniform. Most of the districts do not have technical educational institutes. The maximum number of technical education is provided in eight technologies that are not mostly related to CPEC projects. TVET skill trades for the duration of two years and one year are also limited in terms of access to all the districts, number of TVET trades, and relevancy to CPEC projects in the province. The TVET trades of the duration of six months and three months are distributed to almost all the districts of Baluchistan, but these skill trades are mostly vocational and meet the demands of conventional labor market needs in the province. Conventional skill trades tailoring, knitting, beautician, dress making, plumber, carpentry etc. dominates and overlaps in most of the districts across the province. Similarly, technical TVET trades, except very basic about computer & IT skills, are mostly missing in six and three months of skill provision aspects of provincial TVET system.

**Table-1: Department wise Distribution of Public & Private Sector TVET Institutions**

<b>Name of Department</b>	<b>No. of Public Sector TVET Institutes (functional + non-functional)</b>	<b>No. of Private Sector TVET Institutes (functional + non-functional)</b>	<b>Total no. of TVET Institutes (functional + non-functional)</b>
<b>Department of Labor &amp; Manpower</b>	<b>20</b>	<b>344</b>	<b>364</b>
<b>Department of Social Welfare</b>	<b>44</b>	<b>0</b>	<b>44</b>
<b>Department of Education</b>	<b>9</b>	<b>0</b>	<b>9</b>
<b>Department of Commerce &amp; Small Industries</b>	<b>129</b>	<b>0</b>	<b>140</b>
<b>NAV TTC Regional Office Quetta</b>	<b>0</b>	<b>35</b>	<b>35</b>

Sources: Four Provincial Departments & Regional NAVTTC Office Quetta-2016/2017

Author's own calculations

**Table-2: District wise Provision of TVET Trades**

<b>District Name</b>	<b>Three Years (No of Trades)</b>	<b>Two Years (No of Trades)</b>	<b>One Years (No of Trades)</b>	<b>Six Months (No of Trades)</b>	<b>Three Months (No of Trades)</b>
Awaran				4 technologies	2 technologies
Barkhan				3 technologies	2 technologies
Bolan				3 technologies	2 technologies
Chaghi				4	2

				technologies	technologies
DeraBugti		1 technology of Carpet	3 Technologies	3 technologies	2 technologies
Gwadar	3 technologies		11 Technologies	7 technologies	4 technologies
Harnai				2 technologies	2 technologies
Jaffarabad		1 technology of Carpet		6 technologies	5 technologies
JhalMagsi				3 technologies	2 technologies
Kalat		1 technology of Carpet	5 Technologies	4 technologies	3 technologies
Kech	3 technologies		5 Technologies	2 technologies	3 technologies
Kharan		1 technology of Carpet		5 technologies	2 technologies
Khuzdar	3 technologies	1 technology of Carpet	10 Technologies	5 technologies	3 technologies
Kohlu		1 technology of Carpet		3 technologies	2 technologies
Lasbela	5 technologies	1 technology of Carpet	12 Technologies	3 technologies	3 technologies
Loralai	6 technologies	1 technology of Carpet	8 Technologies	4 technologies	4 technologies
Mastung		1 technology of Carpet		4 technologies	2 technologies
Musakhail				2 technologies	2 technologies

Nasirabad			7 Technologies	4 technologies	2 technologies
Nushki		1 technology of Carpet		3 technologies	2 technologies
Panjgur				3 technologies	2 technologies
Pishin	3 technologies	1 technology of Carpet		4 technologies	2 technologies
KillaAbdullah		1 technology of Carpet	9 Technologies	6 technologies	2 technologies
KillaSaifullah	3 technologies			3 technologies	2 technologies
Quetta	8 technologies	1 technology of Carpet	15 Technologies	13 technologies	5 technologies
Sherani				2 technologies	2 technologies
Sibi	4 technologies	1 technology of Carpet	4 Technologies	7 technologies	4 technologies
Washuk				2 technologies	2 technologies
Zhob		1 technology of Carper		3 technologies	2 technologies
Ziarat		1 technology of Carpet		4 technologies	2 technologies

Sources: Four Provincial Departments & Regional NAVTEC Office Quetta-2016/2017

Author's own calculation

### **Objective # 2. Provincial Economic Corridors & TVET Need:**

**Proposed Economic Corridors for the Province:** The official document of Baluchistan Youth Policy (2015) introduced six provincial economic corridors for regional connectivity among the upper, central, and lower parts of the province. This following table-3 gives a clear direction for

the introduction of new & scope-bearing TVET trades suitable for each proposed provincial economic corridor. Skill mapping for each of the provincial economic corridors is needed to integrate geographic integrity with labor market mechanism and emergence of economic activities related to these corridors. The following six corridors cover almost 90% of the geographic area of Baluchistan. Skill identification for each corridor may better serve for socio-economic uplift of the people and get their integration with the overall CPEC projects in the province.

**Table -3: Proposed Economic Corridors & Districts in the Corridor**

<b>Proposed Corridor</b>	<b>Economic</b>	<b>No.</b>	<b>Districts in the Corridor</b>
Non-Staple/high value products/coal/mineral, fruit hub		1	Zhob, Killa Saifullah, Loralai, Sibbi, Musa Khel Ziarat
Gas and crops in irrigated areas		2	Dera Bugti, Nasirabad, Jaffarabad, Jhal Magsi
Karachi-Khuzdar-Quetta-Chamman Corridor: Trade hub way		3	Lasbela, Khuzdar, Kalat, Quetta, Pishin
Gwadar-Mustung Corridor		4	Gwadar, Panjgur, Washuk, Kharan
Port-Mineral Corridor, Fruit, Trade, Minerals		5	Chagai, Washuk, Panjgur, Kech, Gwadar
Fisheries, Port & Shipping, & International Trade		6	Gwadar, Lasbela

Data Sources: Baluchistan Youth Policy: 2015, GoB

Modified by the author

**Objective # 3. Identification of Relevant Skills in the Select Economic Sectors:** Government of Baluchistan has identified the following economic sectors that have been dominantly serving for livelihood earnings and socio-economic uplifting for major segment of provincial labor force.

The government documents also hint that these sectors may yield the provincial population comparative advantage for job growth, livelihood earnings, and employment generation in the wake of CPEC projects. Thus, many TVET skill trades are identified as per research methodology and placed in front of the select economic sectors in the following.

#### **List of Skill Trades for the Select Economic Sectors in Baluchistan:**

**Mines & Minerals:** Baluchistan is a natural resource rich province of Pakistan (GoB, 2018). The following TVET skill trades are proposed for skilling the provincial labor force to ensure their socio-economic returns in the sectors of mines and minerals.

TVET skill trades for mines and mineral include skills in Quarrying, Mining Diplomas, Draftsman & surveyors, Low Skills for Mining, Resource Identifiers & Specialists, Petrochemists, Stone identifications diplomas, Gems & Jewelry Specialist, Miners, Clerical staff, Resource Managers, and entrepreneurship for Mines & Minerals.

**Agriculture:** Agriculture sector is placed second in terms of livelihood earnings for employment in the province (GoB, 2018). The following TVET skill trades for agriculture development and job growth in this sector are identified.

The skill trades in Veterinary, Poultry & Dairy Assistants, Fruit Processing, Preservation, Packaging & Logistics Gardening & Horticulture Tunnel Farming, Bidding and Seed Sewing Experts, Water management courses, Orchard specialists and care takers, Fruit preservation techniques, are Fruit value chain diplomas are needed for this very potential economic sector in Baluchistan.

**Construction:** It also capture handsome amount of labor force engagement in the province (GoB, 2018). The skills of Shuttering, Carpenter, Aluminum Fabricator & Steel Fixer Carpenter, Woodwork & Handicraft, Civil Drafting, Auto CAD, Civil Surveyor, Quantity Surveyor, Hi-Tech Fitter, Pipe fitter & Fabrication, Mason & Tile fixer, Plaster, Plumber / Pipe Fitter, Scaffolder, Welder, Concrete Plant Operator, and many more are identified for this sector in the province.

**Hospitality & Tourism:** Hospitality is one of the cultural attributes of the people of Baluchistan. The geographic location, environmental variety, and tribal set ups preserved hospitality and respects for the foreign visitors and tourists to this geographically vast province of Pakistan. The provincial department for culture and youth affairs encourages hospitality and tourism as one of the potential industry for the labor force of the province (BYP, 2015). The following TVET skill trades are identified for the promotion of hospitality and tourism industries in the province. It includes certificates and diplomas in areas of Tourist guides, Local food experts, Archive Specialists, Archive Short Courses for provincial heritage, House Keeping, Hotel & Management, Rest House Personnel, Cooking / Chef, Cultural Experts and Guides, Social Mobilisers, and Social entrepreneurs.

**Objective # 4. CPEC Projects for Baluchistan & Relevant TVET Skills:** There are 12 CPEC projects devised for Gwadar and the development works on most of them are started (Table-4). However, skill identification and its development for most of the projects are yet to be devised for sustainable socio-economic growth of the people of this least developed province of Pakistan. The details of the projects are given by the Planning Commission (2018). Tentative list for relevant TVET skill trades are given after following table-4.

**Table-4: CPEC Projects for Gwadar**

S. No.	Project Name	Estimated Cost (US\$ M)
1	Gwadar East-Bay Expressway	140.60
2	New Gwadar International Airport	230.00
3	Construction of Breakwaters	123
4	Dredging of berthing areas & channels	27
5	Development of Free Zone	32
6	Necessary facilities of fresh water treatment, water supply and distribution	130.00
7	Pak China Friendship Hospital	100
8	Technical and Vocational Institute at Gwadar	10.00

9	Gwadar Smart Port City Master Plan	4
10	Bao Steel Park, petrochemicals, stainless steel and other industries in Gwadar	NIL
11	Development of Gwadar University (Social Sector Development)	NIL
12	Upgradation and development of fishing, boat making and maintenance services to protect and promote livelihoods of local population	NIL

Source: Ministry of Planning Development & Reform. <http://cpec.gov.pk/index#>

**Tentative List of Identified Relevant TVET Skill Trades for 12 CPEC Projects of Baluchistan:** The following section identifies generic area of TVET skill trades in the context of CPEC projects in Baluchistan. The identification of skill trades are confined to each project of CPEC and present a broader area of relevant TVET skills for job growth and human capital formation in Baluchistan. Broader area and names of TVET skill trade mentioned in front of the following CPEC projects in Baluchistan.

1. **Coal Power Project & Coal-fired Power Plant, Gwadar & Hub:** For these two projects, the following technical and vocational skill trades are identified.

Skills for coal recorders & inspectors, coal draftsman, mines architectures, coal miners, line technicians, electricians, and power line workers, cable operator to install and repair cables. Skills for coal power plant engineers, power plant operators, power plant monitoring training, plant power inspectors, plant power repair & maintenance trainings. Skills for coal power generation like operators for coal generators, transmission experts, line distributors, coal power linemen, meter readers, and electricity distributors. Boilers and turbines operators, boiler managers & makers, welding technologies and mini turbine technology operators, pipefitters, pipe players techniques, welders, maintenance of turbine, auxiliaries and helpers of thermal power plants. Coal heat makers and ignition masters, coal turbine warehouse dealers, coal environment preservations and environment supervisors and invigilators are included in skill trades. Computer operator to regulate coal, turbines, operations, management, & equipment, record readings from coal heat-up statistics, and skills for safety and security courses. Electrical engineers, mechanical engineers, research engineer, energy system engineers, and engineering

scientists. Coal project economists, managers, energy auditors, project coordination, budget and cost analysts for both the coal power project at Gwadar and coal-fired power plant Hub.

2. **Khuzdar-Basima Road N-30:** The following technical and vocational skill trades are identified the roads and corridor projects in Baluchistan.

The skill trades are construction laborers, road builders, skills for paving, surfacing, widening and surfacing roads. Construction equipment operators and mechanics for heavy machines like bulldozers, cranes, tractors, roller, and other equipment required in road making. Environment protections skill trades. Skills for tree plantations by the roads & highways sides, skills for heavy traffic management & traffic security providers, skills for potholes and damaging repair certificates, and pavement laying techniques are included. Roadside tourism, reservation centers, rest house, and skill diplomas in road stay houses. Skills for road marking, painting, road signs, traffic lights, and light poles, etc. Roads & highways side business start-ups from heavy vehicles' wheels & tube technologies to skills for mechanical & electronics garages.

3. **Gwadar East-Bay Expressway:** The following trades are generally mentioned for this project.

Skill trades for coastal tourism and hospitality. Skill trades for operation and control. Vocational trades for road surveyors, local area identification, soil identification, geological knowhow, equipment systems, and routine maintenance. Traditional skills for road equipment, coordination, repairing, and trainings for traffic instructions are needed. Associate diplomas in engineering, architects, transport operations, cargo, forklift operator, store man, auto electrician, and auto mechanic are suitable. Vocational skills for travel agents, toll plaza management, and traffic police, emergency service, and road first aid courses.

4. **Gwadar International Airport:** The airport would be an international airport of CPEC for Pakistan. So the following skill trades are identified in this study.

Skills for air cabin crew with good communication and interpersonal skills, proficiency in required languages, diplomacy and tact, cultural knowhow, airport hosts & hostesses are needed. Luggage & baggage skills specific to airport, handler, managers, trolley and baggage handler are required as per the airport need. Skills for information about flights, airport, and related

assistance, skills for transportation facilities providers from airport buses to rent a car and hotel management will work for job growth. Diplomas in airport receptionist, office management skills, skills for restaurants, hotel services, and skills for airport security and airport maintenance would direly be needed. It needs skills for IT & computer for customer facilitations and care, skills for airport canteens, boarding houses, and flight reservations etc. Skills for security check, security machines maintenance, camera watch and assistance, security technicians, etc. All engineering skills and diplomas from civil, aeronautical to electrical, and computer are necessary conditions for full functioning of this airport. Aviation skills for pilot, air hosts & hostess, flight technicians, engineering cadre, sub-engineering cadre, medical staff, air police traffic staff, etc.

**5. Construction of Breakwaters:** The following list of skill trades are mentioned here.

Associate and degree level skill diplomas in coastal engineering, civil engineers, water engineering, shipping technologies, construction labors, and marine engineers. Diplomas and professional certifications in maintenance of break waters, calculation of moving flow of water, water storms, and shipping parking should be provided to local people of Baluchistan. Diplomas in skills like monitoring of volumes of water and water density. Diplomas in flood management and defense system are needed for sustainable functional of this big CPEC opportunity. Diplomas in coastal management are needed for breakwater economic opportunity. Associate diplomas for skills in longshore drift, rock lifting, anchoring assistance and crew development, exploitation of quarry rocks, and so on

**6. Dredging of Berthing Areas & Channels:** These are names of skill trades for this invaluable CPEC project at Gwadar Deep Sea Port.

The TVET trade skills in digging skills, dredging equipment like digging machine operators, monitoring and maintenance of dredging equipment, water berth specialists and geologists are needed. Skill trades in monitoring, maintenance, dredging, and water gauges/dials/indicators technologies. Skill for machine inspectors, mechanics, and service provisions to channels and berthing soundness, structural soundness and compliance skills, and berthing specifications are required. Skills for berth making, polishing, maintenance, and operators, and skills for dredging channels making and managing are necessary for this function.

7. **Technical and Vocational Institute at Gwadar:** The institution at Gwadar must start the following TVET skill trades for human resource development in Baluchistan.

Vocational skill trades that are culturally embodied with local modes of techniques particularly courses/diplomas in Baluchi and Pashtun wool weavers, Baluch chapel making, Baluchi cobblers, Baluch potters, Baluch and Pashtun handicrafts, craftsmen, Baluchi and Afghani carpets, Baluchi and Pashtun embroidery work, Baluchi brassware, Baluchi rugs, traditional bangles, Baluchi handmade jewelry, Baluchi ceramics, Baluchi cutlery, Baluchi wood work, etc.

Skill trades for marine sciences and marine courses like marine associate engineering diplomas, marine electro technology, aqua nautical science, offshore courses, and maritime trainings. Skills for marine and sea resort tourism, deep sea water tourism, tourist ship and crew drivers, conductors, helpers, sea tourists' diplomas, sea food and fisheries associate diplomas, skills for marine life preservations, skill trades for water cleaning and hygiene, and water technology related skill trades for marine and aqua flora and fauna etc.

Skill trainings for firefighting, water rescue, sea survival, and water safety for tourists and deep sea working personnel. Skill trades for navy and naval services, navigation, sailing, fishing, sea hunting, and deep water hunting entertainment. Skill trades for rearing water and marine livestock production, value chain management, marine food exports, food preservation, warehouses for marine food productions, packaging and packing, gradation of marine food, marine clinical and preventive medicines, diplomas for marine farm machinery, animal nutrition schedule, aqua-dairy production, and value additions for marine foods productions.

Technical skill trades for hydronic technology, water surveys, welding and fabrication, metal fabricator, boiler maker, pharmacy technician, veterinary and marine life technicians.

Vocational skill trades available on NAVTTC website for vocationally training courses like electrician, carpentry, plumber, beautician, culinary arts etc. Vocational training courses announced under the “*Skilling Pakistan*” project of Prime Minister Pakistan with specification to Gwadar Deep Sea Port and Smart Port City Projects.

Skill diplomas for construction courses like port city construction, construction operations, estimating, construction supervision, gas and aqua equipment fitters, insulation courses, power

technology, heating and cooling trades, air conditioning technologies, ice-making and melting diplomas, technicians, electrician, and many more specific to all the major and minor projects of CPEC in Baluchistan. Maintenance trades and skills like pump maintenance, sewerage, roadworks, street works, surveyors, and draftsman etc.

Chinese recommended skill trades applicable in Baluchistan may also be started at this TVET institution for human resource development in Baluchistan.

**8. Pak China Friendship Hospital:** It should be established as teaching hospital.

Skill trades for all the paramedical skills like child birth, ECG interpretation, skin suturing, airway management and incubation etc.

Nursing skills like arthroscopy courses for nursing, physical therapy courses, first aid courses, diagnostic tests and medication courses, advance orthopedics course for nurses, medical surgery nursing course, X-ray, MRIs training, gynecological courses, etc.

Laboratory skills like laboratory technicians, blood sampling technology, blood/urine testing technologies and sampling technicians, drips and injection technicians, medical treatment supervisors, and medical technicians.

Skill trades for dental hygiene technology, aestheticians, support workers, patients' assistance, emergency ward and funeral services, First Aid operators and providers, etc.

Skill trades for all areas of specialists in medical surgery and physicians like, orthopedics, cardiology, nutritionist, dermatologist, diet specialists, surgeons, cardiologists, eye specialist, pathologist, general physician, psychologist, etc.

Skill trades for hospital building care taking like, plumber, carpenter, electrician, etc. Skill trades for hospital security services, CCTV camera operators, police, etc.

**9. Smart Port City at Gwadar:** Smart city project at Gwadar is one of the big projects in Baluchistan. However, skill trades are generally mentioned in the following areas of TVET specialization for human resource development in Baluchistan.

Skills dissemination in TVET areas of city site development, planning, and implementation, designing and architecture in urban and landscaping for this modern sea port city are identified. Skill diplomas for planning policy, land use, housing societies, and commercial based diplomas for metropolis development will be needed for the expansion of smart port city in Gwadar.

Some of the language skills for Baluchi, Brahui, Pashto, Urdu, Chinese, and English Proficiency could add socio-economic integration in future.

Skilling officials of GDA and Smart Port City for maintaining the socio-economic development of local population, and diplomas for urban management, urban economics, and city planning are necessary for professional development of officials of this city

Skill trades for transport, retail and business start-ups, communication, and city consultation, skill trades for housing, commercialization, market analysts, businessmen, vendor, retailers, and whole sale dealers in according with socio-economic and metropolitan norms of the Gwadar Smart Port City.

Sea resort, tourism diplomas, disaster and risk management courses, diplomas of trade for Port city, diplomas and certificates for heritage sites and local culture, and skills for water supply, sewage and waste water disposal, solid waste management, storm water drainage, are also needed for making the first ever Smart Port City at the highest levels of provisions of municipal services in Pakistan.

**10. Bao Steel Park, Petrochemicals, Stainless Steel and other Industries in Gwadar:** The following TVET skill trades are recommended for job growth under this project in Baluchistan.

Technical skills trades for metallurgy, metal fixer, steel erectors, steel fixers, machine operators, technicians, construction works, machinery operators, cargo management, broilers, chemists, supervisor for reactors, laboratory to test metals.

Technical skill trades for tyre and tube making, petrochemical byproducts, rubber making, petroleum jelly making, and so on.

Technical skills for chemists like, extraction of metal, site specific chemists, technical inspectors, petrochemical diplomas, and other related TVET skills for steel sheet making and manufacturing.

**11. Development of Gwadar University:** Human resource development and its requirements for Baluchistan can be better and effectively started with the commencement of relevant general and technical education and trainings in the field of science and technology. The provincial labor force may be kept abreast with the levels of human capital formation of other provinces if the following educational opportunities are provided at the portal of Gwadar University to the local and youth population of Baluchistan.

In future, all the general and technical education and skills that would help in human capital formation of local people of Baluchistan particularly in Physical and Natural Science, IT, Management & Economics, Resource Management, Mining and Natural Resources, Local Gems & Jewelry, Marine Sciences, Engineering, and other subjects.

The Gwadar University must have CPEC center of Excellence for MoUs collaborations and joint ventures among all the stakeholders of CPEC, Federal government, Provincial government, Local people, Local investors, and Chinese investors.

The Gwadar University must establish Collaborative Centers of Excellence between Gwadar University and major high ranking universities of China for human resource development through exchange programs, R&D, and degree programs of joint ventures.

**12. Upgradation and Development of Fisheries at Coastal Areas of Gwadar Deep Sea Port:** Baluchistan occupies a big portion of total coastal area of Pakistan. It has one of the deepest sea ports in the regions. It has huge capacity of sea and fisheries products and byproducts to fulfill the water and sea based nutrition of people not only inside Pakistan but also to foreign sea food customers of the region. So, the huge sea food producing region and coasts of Baluchistan can be better developed with the provision of the following TVET trades related to fisheries and allied economic sectors of sea food, coastal and deep sea natural habitats for sea food production.

Diplomas and skills in big ships and vessel maintenance, vessel refrigeration system, vessel discharge system, vessel mechanics and electrical works, vessel engine repair and maintenance, vessel diesel technologies, shipboard electrical power installation, vessel safety, health and physical education, very specialized courses in deck, engine, navigation skills, vessel loading and stowage services, vessel crew, vessel safety and security, and vessel assistants.

Skill trades in fishing techniques of fish catching, fish preservation, fish and sea food technologies, fish tackling, sea food value chain and value addition, fish cleaning and handling skills, and vocational and technical skill trades in boat building, boat manufacturing, and boat making assistance, boat repairing, and ship righting.

Skill techniques in making small, modern, and technologically updated boat with plastic, wood, fiber glass, wool steel aluminum, and other ready mixtures and composites.

**Objective # 5. Conclusion & Policy Recommendations:** It is concluded that Baluchistan is the least developed province of Pakistan and yet has huge potential like Gwadar Deep Sea Port and abundance of unexplored natural resources that would lead the economy of Pakistan to the highest progression of socio-economic development once the economic potential of the province is utilized under the mega macroeconomic and global economic projects like CPEC. Human resource development is one the key factors necessary for socio-economic growth and it depends heavily upon human capital formation through investing in people and uplifting its human capitalism through TVET provision specifically according to the needs of CPEC projects in Baluchistan. In this regard, the following recommendations are put forth as policy recommendations for job growth and human resource development through identification of relevant TVET skill trades in the context of approved CPEC projects for Baluchistan.

1. It is recommended that the provincial capacity and scope for TVET provision must be enlarged for job growth and human capital formation in the context of CPEC projects.
2. Investment in TVET skill provision must be increased as per the needs and recommendations of UNESCO for skill development and SDGs for socio-economic development of local people in Baluchistan so that they are also included in the overall CPEC project and its socio-economic prospects in the future.

3. Strong collaborations and MoUs are needed among the provincial TVET departments, B-TEVTA, AVTTC, Skill Development Councils, Overseas Pakistanis Foundation, and other allied TVET departments and ministries for efficient and effective establishment of TVET system for the human capital formation of the provincial labor force.
4. Skill trades must be assessed with the given tentative skill list for each CPEC project by the officials concerned to that specific CPEC project and other stakeholders to specify the actual and potential needs of most relevant TVET skill trades that could not only fulfill the project based human capital needs and inputs but also work for job growth of the provincial labor force in future.
5. A three and/or four stayer strategy for human capital formation in line with the CPEC projects and its time length of early projects, short-term, medium-term, and long-term strategies in TVET skill provision is strongly recommended to be initiated for the unskilled labor force of the province.
6. Skill mapping for all the CPEC projects is strongly recommended that has strong likelihood to work effectively for job growth and human resource development in the context of CPEC projects in Baluchistan.
7. B-TEVTA must be made functional and independent authority with solving all its legal, administrative, collaborative, financial, authority related, and regulatory issues and problems that are pending with the allied TVET departments of province since 2011.
8. A scheme for skill development collaboration between China and government of Baluchistan is recommended to be established for those technical and vocation skill provisions that are not disseminated in Pakistan and those skills are needed for the CPEC projects of Baluchistan on priority and continuous basis.
9. A comprehensive skill strategy for CPEC projects in relevant skill trades is recommended for overall development of TVET system of Baluchistan so that it would work as one of the official skill documents (say) for the provincial government
10. A comprehensive way-out for future strategy is recommended for the apex CoE-CPEC to continue and follow the viable and feasible policy options of this study for better socio-economic prospects through skill development in the province.

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**Job Growth & Human Resource Development Divison**

**“Identification of Relevant Technical & Vocational Skills for Job Growth & Human Resource Development in the Context of CPEC Projects for Baluchistan”**

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## **1. Introduction**

Identification of relevant trades/skills, in technical vocational education and trainings (TVET), for the need of prospective CPEC projects, both in short and long terms, are necessary for devising optimal human resource policies for job growth and economic development of all provinces of Pakistan. Baluchistan is the least developed province of Pakistan and its socio-economic development requires focused and objective based policy options under CPEC for skill development, job growth, and human resource development. The system of TVET is not yet explored to know if it fulfills the demand for skills for job growth and human resource development under the prospective CPEC projects in the province. Conventional TVET trades/skills, overlapping of TVET trades/skills provision by different public-sector departments, non-functional status of B-TEVTA, low coordination level among different departments for TVET provision, low skill levels, poverty, insurgency, and other low levels of socio-economic indicators are serious issues to pause the provision and development of relevant TVET trades/skills required for yielding the benefits of prospective CPEC projects in the province. Identification of relevant TVET trades/skills will probably help in devising right policy options, generating more employment opportunities, treatment for skill mismatch, job growth, and human resource development in different sectors of this backward province. Right policy options are not only desirable for the overall socio-economic development of this province but also for the development of positive narration on overall CPEC project in the minds of common people of Baluchistan.

There are 12 CPEC projects to be launched for Gwadar in Baluchistan. These include Gwadar East-Bay Expressway, Gwadar International Airport, Construction of Breakwaters, dredging of berthing areas & channels, Development of Free Zone, Technical and Vocational Institute at Gwadar, and some other projects to cost more than US \$ 1000 million for the development of Gwadar mega projects for socio-economic development of Baluchistan, in particular, and Pakistan, in general. Similarly, CPEC projects in infrastructure, energy, and other sectors of the provincial economy have strong likelihood to boost the standards of living of common people of Baluchistan to promote their livelihoods and socio-economic uplift to enjoy a better quality of life.

Due to low endowment of educational and skill development of the people of Baluchistan, the political economy of CPEC may not yield due shares to its common people. Vision-2025 of government of Pakistan suggests investing in people for their education and skill development on gender parity basis for the provinces. It is necessary to equip people of Baluchistan with necessary and market demanded skills to ensure employment and other economic fortunes in the wake of CPEC projects in the province. TVET system in Baluchistan is comparatively lagged behind for job growth and human resource development in both the technical and vocational skill trades as compared to the TVET system and skill development in other provinces of Pakistan (Ahmed & Khan, 2018).

This research study is designed to focus upon identifying relevant TVET trades/skills in which the province must build the capacity for the provision of relevant TVET trades/skills for proposed CPEC projects and prospective economic activities once get started. It will also serve to give directions for identifying and knowing the extent and nature of skill requirements for medium and long terms CPEC projects and its based labor markets needs in future. The results of this identification study are expected to give directions for policy makers, B-TEVTA, provincial departments working for TVET provision, Chinese investors, unemployed young segment of the province, business community, and other stakeholders to work for the betterment and overall socio-economic development of this backward province of Baluchistan.

The scheme of the study comprises of separate sections each for brief literature review, objectives for the study, research methodology, discussions on each objective, and conclusion and policy recommendations for identification of relevant TVET skills for job growth and human resource development in the context of CPEC projects of Baluchistan.

## **2. Literature Review**

Right policy for human resource development plays an important role for economic growth and development. Mello (2008) and (Heckman, Lochner, & Todd, 2003, 2006, 2008) identify the role of skilled and educated labor contributing for overall economic growth among the countries. Human capital theory recognizes investment in schooling and health important for private and social returns (Schultz, 1961). Becker (1964) differentiated between general and specific trainings and its costs and returns for investment in human to highlight the importance of human

capital formation for getting economic benefits of growth and development. Investment in general schooling and TVET are both considered important for human capital formation under the assumptions of human capital theory. A balanced approach of importance to both the general schooling and skill development in any human resource development policy will ultimately lead an economy towards higher economic growth and development (UNESCO-UNEVOC, 2016).

Path breaking work of Mincerian wage equation (Mincer, 1974) gives empirical evidence to the basic relationship between years of schooling and wage earnings for labor force of USA and the results of positive nexus gave birth to avenue for discussion hitherto in the field of labor economics and economics of education. Heckman et al. (2003) thoroughly discussed that schooling and skill knowledge contribute not only for earnings differentials but also for devising right policy options for human capital formation through the inculcation of both the cognitive and non-cognitive attributes in people via schooling.

TVET is known for increasing the profitability to producers, yielding wage returns and employment opportunities to skilled individuals and overall economic growth for countries like Pakistan (Kazmi, 2007). Mustafa, Abbas, Saeed, and Anwar (2005) highlighted the relationship between variability in skill development and economic growth for the case of Pakistan and the relation evidenced significant correlation in their study. Khilji, Kakar, and Subhan (2012) and Khan, Akhtar, Mehmood, and Muhmood (2013) mentioned the case of Pakistan in comparison with other South Asian economies as less competitive and less globally integrated in terms of trade, finance, and other economic sectors due to low levels of human capital development and skill development among many other major macroeconomic indicators. Literature reveals that TVET at each provincial level and its comparison among the provinces have not been discussed for assessing socio-economic impact of TVET in Pakistan. Only two studies are mentioned in literature by Ahmed and Khan (2018) and Ahmed and Muhammad (2017) and concludes that TVET system in Baluchistan is deplorable to meet the skill needs of CPECT projects in Baluchistan. The job growth for the youth of Baluchistan may not materialize if human resource is not developed on emergency basis for most of the CPEC projects in Baluchistan. Lack of literature suggests for proper and scientific studies at provincial levels, for each province or/and comparing the provinces, to critically explore TVET systems for designing recommendations of effective policy options for job growth and human resource development in this regard.

There are twelve (12) CPEC projects proposed to be started in Baluchistan. It is hoped that these projects will change the lives of the people living in Baluchistan. Marginalized people of the province will get due returns from these projects. Most of the economic sectors, that is, agriculture, industry, services, commerce, seaports, Gwadar port, and the public and private sectors will be benefited socio-economically from the outputs of these projects. Chinese and other foreign investors will invest in unexplored and resource rich sectors of Baluchistan for the prosperity and economic development of this province (Planning Commission, 2016; GoP, 2018).

The likelihood of getting better share and acquiring socio-economic development from most of economic activities and projects relies upon human resource and skill development in economies. The current scenario of low levels of education and skill deficiency in Baluchistan are major challenges to threaten potentially the overall development in Baluchistan (GoB, 2015). Skill levels and human resource development in Baluchistan seems not up to the mark to compete with highly skilled labor of other province and Chinese labors in labor markets that could emerge in the wake of generated economic activities of CPEC projects. Job growth for the people of Baluchistan may not be materialized as per requirements for uplifting their socio-economic development due to weak position of human resource development in the province.

The provincial capacity for designing right and effective policies for human resource and skill development are yet to be made or designed for job growth in the wake of CPEC projects. The provincial government, with the help of its departments of Planning and Development, B-TEVTA, and other TVET departments, has identified the need of skill development and provision to the people of Baluchistan for CPEC projects. These effective policies are also necessary to get local people integrated with the proposed CPEC projects and ensuring due shares of socio-economic prospects, job growth, and employment generation for them. The federal government also consider human resource development and skill provisions policy as an integral part of the overall set of policy options designed for CPEC and its projects in the province (Balochistan, 2011; GoB, 2015; NAVTTC, 2016).

NAVTTC (2018) reports skill development for Baluchistan in the lowest categories of TVET enrollment, TVET pass outs, TVET institutions, number of TVET skill trades, and overall skill development. Most of the TVET skills are conventional and not specifically provided as per the

expected needs and requirements of CPEC projects in the provinces. Even, TVET skill relevancy to CPEC projects is not identified by any federal or provincial TVET authority, department, and other bodies. The probability of low development persistency and backwardness of people in every walk of CPEC generated socio-economic activity may prevail if the people of the province are not provided with relevant TVET skills in the province. B-TEVTA has, as yet, not publicly announced a policy for TVET development in the province to convince related and allied departments to work under the official umbrella for the development of skills to the unskilled people of Baluchistan as P-TEVTA does in the province of Punjab (Balochistan, 2011; NAVTTC, 2016; P-TEVTA, 2018).

This research project has steered in the milieu of deficiency of proper and right human resource development policy, specifically, identification of relevant TVET skills for job growth and human resource development in the context of CPEC projects for Baluchistan. The study will give directions for devising right TVET policy for the least developed province of Baluchistan.

### **3. Objectives of the Study**

1. To give a snapshot of the existing TVET system for skill development in the province and identifying its scope and role for the provision of CPEC relevant TVET trades/skills in the province.
2. To introduce the provincial economic corridors and direction identification for its TVET provision.
3. To identify relevant TVET trades/skills for the select economic sectors of the province.
4. To identify relevant TVET trades/skills for selected proposed CPEC projects of Baluchistan.
5. To recommend policy options for the introduction of relevant TVET skills for job growth and human resource development in the context of CPEC projects for uplifting socio-economic development of Baluchistan.

### **4. Research Methodology**

Methodology for this study is comprised of the following surveys.

**4.1. Desktop Survey:** It includes desktop survey and review of literature in detail. Research articles, TVET official reports, online TVET related materials, books readings about TVET, TVET periodicals, and web pages and web portals of TVET departments, institutions, and other bodies are consulted thoroughly and purposively for giving research context, right directions, and proper insight to proceed further the remaining steps for successful completion of this relevant study to CPEC projects about Baluchistan.

**4.2. Field Survey:** It includes the following phases.

**Phase 1.** It includes extensive field work/survey in multiple visits to TVET related departments and institutions, both at provincial and federal levels, informal discussions and meetings with TVET authorities and subject matter experts for discussions on the subject matter and scope of this research work for the case of relevant skills in the context of Baluchistan. Informal discussions include meetings with directors of four TVET related departments of provincial government, B-TEVTA, NAVTTC, two principals of polytechnic colleges, HODs of technical and vocational centers, TVET trainers, TVET qualified individuals, some of the subject matter experts, and project authorities of some of the select CPEC projects launched in the province. Around 30 plus individuals are consulted in this phase throughout Baluchistan. This phase updated the author for the context of relevant TVET skills and further steps ahead to formally complete the project.

**Phase 2.** It includes the identification of relevant TVET trades/skills provision and expected demand and skill requirements with which CPEC projects of the province are directly and indirectly related. Similarly, this phase is reserved for identifications of relevant trades/skills and its needs for some of the select sectors like, agriculture, mines and minerals, construction, special economic zones, and B-TEVTA proposed TVET skills for the province.

**5. Procedure for Identification of Relevant TVET Skills:** It contains the following ways of skill identification for the CPEC projects and the select economic sectors of the province.

**5.1.** Provision of all the TVET skills by provincial TVET departments is consulted to know the context and capacity of relevant TVET trades for CPEC projects.

- 5.2. Skill needs, assessment, and identifications are sought out and listed from the TVET experts mentioned in Phase 1 of research methodology.
- 5.3. The select economic sectors are identified in which the province has potential for economic development. Relevant skill trades are sorted out from TVET departments, list of skill trades by UNESCO, and internet sources available for the same sectors mostly related to Pakistan. The skill trades are rectified from the HODs and subject matter experts of the same economic sectors. The skill trades are also tallied with NAVTTC list of TVET trade skills for its “Skilling Pakistan” program. At the end, sector wise relevant TVET trades skills are enlisted for this study.
- 5.4. Since, there are 12 CPEC projects proposed by national sources of CPEC projects in the province. Relevant TVET skill trades are sorted out from TVET departments, list of skill trades by UNESCO, and internet sources for each CPEC project in accordance with availability of TVET skill trades officially proposed and recognized for the like sectors in other economies of the world. For instance, for Gwadar Deep Sea Port, the list of skill trades of Dubai Sea Port is taken as a starting point for identification. The skill trades in the list are then rectified from HODs and subject matter experts associated with the same CPEC project, authorities of NAVTTC, and B-TEVTA. The rectified list of relevant TVET skill trades are also tallied with TVET lists of B-TEVTA and NAVTTC for job growth and human resource development in the context of Baluchistan.
6. **Discussions on Each Objective of the Study:** Discussions are arranged in the context of set objectives one by one in the following manner.

**Objective # 1. Existing TVET Mechanism in the Province: Scope and Relevancy:** It comprises of public and private TVET skill provision in the province.

**Public Sector Provision of TVET in Baluchistan:** Mainly, there are four public sector departments, one TVET authority, and one regional directorate of NAVTTC is established for the provision of TVET skills and education in the province.

**Department of Higher and Technical Education:** The technical education directorate of this TVET department disseminates polytechnic based diplomas and certificates in nine (9) associate engineering technologies in the province. It is aimed at educating people of the province with poly and mono skills and technics.

**Social Welfare Department:** It works for women and vulnerable segments of the population to enhance their status with active participation based on skill provision, training opportunities, community development both in rural and urban areas in the province. It has established more than 100 rural and urban development centers throughout Baluchistan for three months skill provisions in three to four TVET trades of computer, handicrafts, tailoring, and dress designing.

**Labor & Manpower Department:** It is one of the main departments for training and development of manpower, and preparing skilled labor for the labor markets of the province. It has established technical and vocational training centers mostly in divisional headquarters of the province for around 25 plus TVET skill trades to train young segment of the rural and urban population.

**Industries & Commerce Department:** It is assigned under one of the official ordinances for the dissemination of skills necessary for the industries of carpets, handlooms, handicrafts, and fisheries to the unskilled people. Small industries wing of this department works for these conventional types of skill trades provisions at every divisional headquarters of the province.

**BTEVTA:** It is established as an authority to bring the allied TVET related departments (mentioned above) under one umbrella for better organization of skill provisions to the unskilled population of the province. It is partially recognized by the some of the allied departments due to administrative, legal, and collaborative issues from the part of general roles and administration among the these TVET departments under the official document of Rules of Business (2011) of government of Baluchistan and pending decisions for administrative settlements B-TEVTA and the mentioned TVET departments (GoB, 2011).

**Private Sector Provision (NGOs & Informal Apprenticeship) of TVET:** There are many NGOs, NPOs, & other organizations responsible for the provision of TVET in the province. These private sectors TVET institutions are registered and affiliated with NAVTTC and the above mentioned TVET departments for skill dissemination. Around 300 plus institutions are registered with Labor & Manpower Department but most of them are non-functional. The functionality of these private sector institutions relies upon fund availability from donors and in the time of fund hunting and winning financial sponsorship from TVET projects and donors for the provision of TVET skills in the province. Other departments have no such sponsorship like

activities for private sector to work for TVET provision. BTEVTA has also not yet started to work for private sector for TVET provision due to financial & capacity constraints. NAVTTC has given around 200 plus private institutions the projects of Prime Minister's "*Youth Skill Development Program*" for Skilling Pakistan in the last four phases of skill development in the province.

**Capacity of Relevant TVET Skills for CPEC Projects:** Up till now, as per official rules, policies, documents and reports, none of the TVET departments and authorities has identified and enlisted relevant TVET skill program(s) designed for job growth and human resource development in the context of CPEC projects in the province. The following tables show this deficiency of skill provisions in the province.

**Department wise Distribution of Public & Private Sector TVET Institutions:** The table-1 shows a snapshot of the TVET institutions working for the provision of TVET in the province. Due to partially and non-functionality of most of these institutions, TVET departments have to work of identification, introduction, and dissemination of relevant TVET skills for the upcoming CPEC projects in the province.

**District wise Provision of TVET Trades:** The following table-2 indicates that TVET trade distribution across all the districts of Baluchistan is not uniform. Most of the districts do not have technical educational institutes. The maximum number of technical education is provided in eight technologies that are not mostly related to CPEC projects. TVET skill trades for the duration of two years and one year are also limited in terms of access to all the districts, number of TVET trades, and relevancy to CPEC projects in the province. The TVET trades of the duration of six months and three months are distributed to almost all the districts of Baluchistan, but these skill trades are mostly vocational and meet the demands of conventional labor market needs in the province. Conventional skill trades tailoring, knitting, beautician, dress making, plumber, carpentry etc. dominates and overlaps in most of the districts across the province. Similarly, technical TVET trades, except very basic about computer & IT skills, are mostly missing in six and three months of skill provision aspects of provincial TVET system.

**Table-1: Department wise Distribution of Public & Private Sector TVET Institutions**

<b>Name of Department</b>	<b>No. of Public Sector TVET Institutes (functional + non-functional)</b>	<b>No. of Private Sector TVET Institutes (functional + non-functional)</b>	<b>Total no. of TVET Institutes (functional + non-functional)</b>
<b>Department of Labor &amp; Manpower</b>	<b>20</b>	<b>344</b>	<b>364</b>
<b>Department of Social Welfare</b>	<b>44</b>	<b>0</b>	<b>44</b>
<b>Department of Education</b>	<b>9</b>	<b>0</b>	<b>9</b>
<b>Department of Commerce &amp; Small Industries</b>	<b>129</b>	<b>0</b>	<b>140</b>
<b>NAV TTC Regional Office Quetta</b>	<b>0</b>	<b>35</b>	<b>35</b>

Sources: Four Provincial Departments & Regional NAVTTC Office Quetta-2016/2017

Author's own calculations

**Table-2: District wise Provision of TVET Trades**

<b>District Name</b>	<b>Three Years (No of Trades)</b>	<b>Two Years (No of Trades)</b>	<b>One Years (No of Trades)</b>	<b>Six Months (No of Trades)</b>	<b>Three Months (No of Trades)</b>
Awaran				4 technologies	2 technologies
Barkhan				3 technologies	2 technologies
Bolan				3 technologies	2 technologies
Chaghi				4	2

				technologies	technologies
DeraBugti		1 technology of Carpet	3 Technologies	3 technologies	2 technologies
Gwadar	3 technologies		11 Technologies	7 technologies	4 technologies
Harnai				2 technologies	2 technologies
Jaffarabad		1 technology of Carpet		6 technologies	5 technologies
JhalMagsi				3 technologies	2 technologies
Kalat		1 technology of Carpet	5 Technologies	4 technologies	3 technologies
Kech	3 technologies		5 Technologies	2 technologies	3 technologies
Kharan		1 technology of Carpet		5 technologies	2 technologies
Khuzdar	3 technologies	1 technology of Carpet	10 Technologies	5 technologies	3 technologies
Kohlu		1 technology of Carpet		3 technologies	2 technologies
Lasbela	5 technologies	1 technology of Carpet	12 Technologies	3 technologies	3 technologies
Loralai	6 technologies	1 technology of Carpet	8 Technologies	4 technologies	4 technologies
Mastung		1 technology of Carpet		4 technologies	2 technologies
Musakhail				2 technologies	2 technologies

Nasirabad			7 Technologies	4 technologies	2 technologies
Nushki		1 technology of Carpet		3 technologies	2 technologies
Panjgur				3 technologies	2 technologies
Pishin	3 technologies	1 technology of Carpet		4 technologies	2 technologies
KillaAbdullah		1 technology of Carpet	9 Technologies	6 technologies	2 technologies
KillaSaifullah	3 technologies			3 technologies	2 technologies
Quetta	8 technologies	1 technology of Carpet	15 Technologies	13 technologies	5 technologies
Sherani				2 technologies	2 technologies
Sibi	4 technologies	1 technology of Carpet	4 Technologies	7 technologies	4 technologies
Washuk				2 technologies	2 technologies
Zhob		1 technology of Carper		3 technologies	2 technologies
Ziarat		1 technology of Carpet		4 technologies	2 technologies

Sources: Four Provincial Departments & Regional NAVTEC Office Quetta-2016/2017

Author's own calculation

### **Objective # 2. Provincial Economic Corridors & TVET Need:**

**Proposed Economic Corridors for the Province:** The official document of Baluchistan Youth Policy (2015) introduced six provincial economic corridors for regional connectivity among the upper, central, and lower parts of the province. This following table-3 gives a clear direction for

the introduction of new & scope-bearing TVET trades suitable for each proposed provincial economic corridor. Skill mapping for each of the provincial economic corridors is needed to integrate geographic integrity with labor market mechanism and emergence of economic activities related to these corridors. The following six corridors cover almost 90% of the geographic area of Baluchistan. Skill identification for each corridor may better serve for socio-economic uplift of the people and get their integration with the overall CPEC projects in the province.

**Table -3: Proposed Economic Corridors & Districts in the Corridor**

<b>Proposed Corridor</b>	<b>Economic</b>	<b>No.</b>	<b>Districts in the Corridor</b>
Non-Staple/high value products/coal/mineral, fruit hub		1	Zhob, Killa Saifullah, Loralai, Sibbi, Musa Khel Ziarat
Gas and crops in irrigated areas		2	Dera Bugti, Nasirabad, Jaffarabad, Jhal Magsi
Karachi-Khuzdar-Quetta-Chamman Corridor: Trade hub way		3	Lasbela, Khuzdar, Kalat, Quetta, Pishin
Gwadar-Mustung Corridor		4	Gwadar, Panjgur, Washuk, Kharan
Port-Mineral Corridor, Fruit, Trade, Minerals		5	Chagai, Washuk, Panjgur, Kech, Gwadar
Fisheries, Port & Shipping, & International Trade		6	Gwadar, Lasbela

Data Sources: Baluchistan Youth Policy: 2015, GoB

Modified by the author

**Objective # 3. Identification of Relevant Skills in the Select Economic Sectors:** Government of Baluchistan has identified the following economic sectors that have been dominantly serving for livelihood earnings and socio-economic uplifting for major segment of provincial labor force.

The government documents also hint that these sectors may yield the provincial population comparative advantage for job growth, livelihood earnings, and employment generation in the wake of CPEC projects. Thus, many TVET skill trades are identified as per research methodology and placed in front of the select economic sectors in the following.

### **List of Skill Trades for the Select Economic Sectors in Baluchistan:**

**Mines & Minerals:** Baluchistan is a natural resource rich province of Pakistan (GoB, 2018). The following TVET skill trades are proposed for skilling the provincial labor force to ensure their socio-economic returns in the sectors of mines and minerals.

TVET skill trades for mines and mineral include skills in Quarrying, Mining Diplomas, Draftsman & surveyors, Low Skills for Mining, Resource Identifiers & Specialists, Petro-chemists, Stone identifications diplomas, Gems & Jewelry Specialist, Miners, Clerical staff, Resource Managers, and entrepreneurship for Mines & Minerals.

**Agriculture:** Agriculture sector is placed second in terms of livelihood earnings for employment in the province (GoB, 2018). The following TVET skill trades for agriculture development and job growth in this sector are identified.

The skill trades in Veterinary, Poultry & Dairy Assistants, Fruit Processing, Preservation, Packaging & Logistics Gardening & Horticulture Tunnel Farming, Bidding and Seed Sewing Experts, Water management courses, Orchard specialists and care takers, Fruit preservation techniques, are Fruit value chain diplomas are needed for this very potential economic sector in Baluchistan.

**Construction:** It also capture handsome amount of labor force engagement in the province (GoB, 2018). The skills of Shuttering, Carpenter, Aluminum Fabricator & Steel Fixer Carpenter, Woodwork & Handicraft, Civil Drafting, Auto CAD, Civil Surveyor, Quantity Surveyor, Hi-Tech Fitter, Pipe fitter & Fabrication, Mason & Tile fixer, Plaster, Plumber / Pipe Fitter, Scaffolder, Welder, Concrete Plant Operator, and many more are identified for this sector in the province.

**Hospitality & Tourism:** Hospitality is one of the cultural attributes of the people of Baluchistan. The geographic location, environmental variety, and tribal set ups preserved hospitality and respects for the foreign visitors and tourists to this geographically vast province of Pakistan. The provincial department for culture and youth affairs encourages hospitality and tourism as one of the potential industry for the labor force of the province (BYP, 2015). The following TVET skill trades are identified for the promotion of hospitality and tourism industries in the province. It includes certificates and diplomas in areas of Tourist guides, Local food experts, Archive Specialists, Archive Short Courses for provincial heritage, House Keeping, Hotel & Management, Rest House Personnel, Cooking / Chef, Cultural Experts and Guides, Social Mobilisers, and Social entrepreneurs.

**Objective # 4. CPEC Projects for Baluchistan & Relevant TVET Skills:** There are 12 CPEC projects devised for Gwadar and the development works on most of them are started (Table-4). However, skill identification and its development for most of the projects are yet to be devised for sustainable socio-economic growth of the people of this least developed province of Pakistan. The details of the projects are given by the Planning Commission (2018). Tentative list for relevant TVET skill trades are given after following table-4.

**Table-4: CPEC Projects for Gwadar**

S. No.	Project Name	Estimated Cost (US\$ M)
1	Gwadar East-Bay Expressway	140.60
2	New Gwadar International Airport	230.00
3	Construction of Breakwaters	123
4	Dredging of berthing areas & channels	27
5	Development of Free Zone	32
6	Necessary facilities of fresh water treatment, water supply and distribution	130.00
7	Pak China Friendship Hospital	100
8	Technical and Vocational Institute at Gwadar	10.00

9	Gwadar Smart Port City Master Plan	4
10	Bao Steel Park, petrochemicals, stainless steel and other industries in Gwadar	NIL
11	Development of Gwadar University (Social Sector Development)	NIL
12	Upgradation and development of fishing, boat making and maintenance services to protect and promote livelihoods of local population	NIL

Source: Ministry of Planning Development & Reform. <http://cpec.gov.pk/index#>

**Tentative List of Identified Relevant TVET Skill Trades for 12 CPEC Projects of Baluchistan:** The following section identifies generic area of TVET skill trades in the context of CPEC projects in Baluchistan. The identification of skill trades are confined to each project of CPEC and present a broader area of relevant TVET skills for job growth and human capital formation in Baluchistan. Broader area and names of TVET skill trade mentioned in front of the following CPEC projects in Baluchistan.

1. **Coal Power Project & Coal-fired Power Plant, Gwadar & Hub:** For these two projects, the following technical and vocational skill trades are identified.

Skills for coal recorders & inspectors, coal draftsman, mines architectures, coal miners, line technicians, electricians, and power line workers, cable operator to install and repair cables. Skills for coal power plant engineers, power plant operators, power plant monitoring training, plant power inspectors, plant power repair & maintenance trainings. Skills for coal power generation like operators for coal generators, transmission experts, line distributors, coal power linemen, meter readers, and electricity distributors. Boilers and turbines operators, boiler managers & makers, welding technologies and mini turbine technology operators, pipefitters, pipe players techniques, welders, maintenance of turbine, auxiliaries and helpers of thermal power plants. Coal heat makers and ignition masters, coal turbine warehouse dealers, coal environment preservations and environment supervisors and invigilators are included in skill trades. Computer operator to regulate coal, turbines, operations, management, & equipment, record readings from coal heat-up statistics, and skills for safety and security courses. Electrical engineers, mechanical engineers, research engineer, energy system engineers, and engineering

scientists. Coal project economists, managers, energy auditors, project coordination, budget and cost analysts for both the coal power project at Gwadar and coal-fired power plant Hub.

2. **Khuzdar-Basima Road N-30:** The following technical and vocational skill trades are identified the roads and corridor projects in Baluchistan.

The skill trades are construction laborers, road builders, skills for paving, surfacing, widening and surfacing roads. Construction equipment operators and mechanics for heavy machines like bulldozers, cranes, tractors, roller, and other equipment required in road making. Environment protections skill trades. Skills for tree plantations by the roads & highways sides, skills for heavy traffic management & traffic security providers, skills for potholes and damaging repair certificates, and pavement laying techniques are included. Roadside tourism, reservation centers, rest house, and skill diplomas in road stay houses. Skills for road marking, painting, road signs, traffic lights, and light poles, etc. Roads & highways side business start-ups from heavy vehicles' wheels & tube technologies to skills for mechanical & electronics garages.

3. **Gwadar East-Bay Expressway:** The following trades are generally mentioned for this project.

Skill trades for coastal tourism and hospitality. Skill trades for operation and control. Vocational trades for road surveyors, local area identification, soil identification, geological knowhow, equipment systems, and routine maintenance. Traditional skills for road equipment, coordination, repairing, and trainings for traffic instructions are needed. Associate diplomas in engineering, architects, transport operations, cargo, forklift operator, store man, auto electrician, and auto mechanic are suitable. Vocational skills for travel agents, toll plaza management, and traffic police, emergency service, and road first aid courses.

4. **Gwadar International Airport:** The airport would be an international airport of CPEC for Pakistan. So the following skill trades are identified in this study.

Skills for air cabin crew with good communication and interpersonal skills, proficiency in required languages, diplomacy and tact, cultural knowhow, airport hosts & hostesses are needed. Luggage & baggage skills specific to airport, handler, managers, trolley and baggage handler are required as per the airport need. Skills for information about flights, airport, and related

assistance, skills for transportation facilities providers from airport buses to rent a car and hotel management will work for job growth. Diplomas in airport receptionist, office management skills, skills for restaurants, hotel services, and skills for airport security and airport maintenance would direly be needed. It needs skills for IT & computer for customer facilitations and care, skills for airport canteens, boarding houses, and flight reservations etc. Skills for security check, security machines maintenance, camera watch and assistance, security technicians, etc. All engineering skills and diplomas from civil, aeronautical to electrical, and computer are necessary conditions for full functioning of this airport. Aviation skills for pilot, air hosts & hostess, flight technicians, engineering cadre, sub-engineering cadre, medical staff, air police traffic staff, etc.

**5. Construction of Breakwaters:** The following list of skill trades are mentioned here.

Associate and degree level skill diplomas in coastal engineering, civil engineers, water engineering, shipping technologies, construction labors, and marine engineers. Diplomas and professional certifications in maintenance of break waters, calculation of moving flow of water, water storms, and shipping parking should be provided to local people of Baluchistan. Diplomas in skills like monitoring of volumes of water and water density. Diplomas in flood management and defense system are needed for sustainable functional of this big CPEC opportunity. Diplomas in coastal management are needed for breakwater economic opportunity. Associate diplomas for skills in longshore drift, rock lifting, anchoring assistance and crew development, exploitation of quarry rocks, and so on

**6. Dredging of Berthing Areas & Channels:** These are names of skill trades for this invaluable CPEC project at Gwadar Deep Sea Port.

The TVET trade skills in digging skills, dredging equipment like digging machine operators, monitoring and maintenance of dredging equipment, water berth specialists and geologists are needed. Skill trades in monitoring, maintenance, dredging, and water gauges/dials/indicators technologies. Skill for machine inspectors, mechanics, and service provisions to channels and berthing soundness, structural soundness and compliance skills, and berthing specifications are required. Skills for berth making, polishing, maintenance, and operators, and skills for dredging channels making and managing are necessary for this function.

7. **Technical and Vocational Institute at Gwadar:** The institution at Gwadar must start the following TVET skill trades for human resource development in Baluchistan.

Vocational skill trades that are culturally embodied with local modes of techniques particularly courses/diplomas in Baluchi and Pashtun wool weavers, Baluch chapel making, Baluchi cobblers, Baluch potters, Baluch and Pashtun handicrafts, craftsmen, Baluchi and Afghani carpets, Baluchi and Pashtun embroidery work, Baluchi brassware, Baluchi rugs, traditional bangles, Baluchi handmade jewelry, Baluchi ceramics, Baluchi cutlery, Baluchi wood work, etc.

Skill trades for marine sciences and marine courses like marine associate engineering diplomas, marine electro technology, aqua nautical science, offshore courses, and maritime trainings. Skills for marine and sea resort tourism, deep sea water tourism, tourist ship and crew drivers, conductors, helpers, sea tourists' diplomas, sea food and fisheries associate diplomas, skills for marine life preservations, skill trades for water cleaning and hygiene, and water technology related skill trades for marine and aqua flora and fauna etc.

Skill trainings for firefighting, water rescue, sea survival, and water safety for tourists and deep sea working personnel. Skill trades for navy and naval services, navigation, sailing, fishing, sea hunting, and deep water hunting entertainment. Skill trades for rearing water and marine livestock production, value chain management, marine food exports, food preservation, warehouses for marine food productions, packaging and packing, gradation of marine food, marine clinical and preventive medicines, diplomas for marine farm machinery, animal nutrition schedule, aqua-dairy production, and value additions for marine foods productions.

Technical skill trades for hydronic technology, water surveys, welding and fabrication, metal fabricator, boiler maker, pharmacy technician, veterinary and marine life technicians.

Vocational skill trades available on NAVTTC website for vocationally training courses like electrician, carpentry, plumber, beautician, culinary arts etc. Vocational training courses announced under the “*Skilling Pakistan*” project of Prime Minister Pakistan with specification to Gwadar Deep Sea Port and Smart Port City Projects.

Skill diplomas for construction courses like port city construction, construction operations, estimating, construction supervision, gas and aqua equipment fitters, insulation courses, power

technology, heating and cooling trades, air conditioning technologies, ice-making and melting diplomas, technicians, electrician, and many more specific to all the major and minor projects of CPEC in Baluchistan. Maintenance trades and skills like pump maintenance, sewerage, roadworks, street works, surveyors, and draftsman etc.

Chinese recommended skill trades applicable in Baluchistan may also be started at this TVET institution for human resource development in Baluchistan.

**8. Pak China Friendship Hospital:** It should be established as teaching hospital.

Skill trades for all the paramedical skills like child birth, ECG interpretation, skin suturing, airway management and incubation etc.

Nursing skills like arthroscopy courses for nursing, physical therapy courses, first aid courses, diagnostic tests and medication courses, advance orthopedics course for nurses, medical surgery nursing course, X-ray, MRIs training, gynecological courses, etc.

Laboratory skills like laboratory technicians, blood sampling technology, blood/urine testing technologies and sampling technicians, drips and injection technicians, medical treatment supervisors, and medical technicians.

Skill trades for dental hygiene technology, aestheticians, support workers, patients' assistance, emergency ward and funeral services, First Aid operators and providers, etc.

Skill trades for all areas of specialists in medical surgery and physicians like, orthopedics, cardiology, nutritionist, dermatologist, diet specialists, surgeons, cardiologists, eye specialist, pathologist, general physician, psychologist, etc.

Skill trades for hospital building care taking like, plumber, carpenter, electrician, etc. Skill trades for hospital security services, CCTV camera operators, police, etc.

**9. Smart Port City at Gwadar:** Smart city project at Gwadar is one of the big projects in Baluchistan. However, skill trades are generally mentioned in the following areas of TVET specialization for human resource development in Baluchistan.

Skills dissemination in TVET areas of city site development, planning, and implementation, designing and architecture in urban and landscaping for this modern sea port city are identified. Skill diplomas for planning policy, land use, housing societies, and commercial based diplomas for metropolis development will be needed for the expansion of smart port city in Gwadar.

Some of the language skills for Baluchi, Brahui, Pashto, Urdu, Chinese, and English Proficiency could add socio-economic integration in future.

Skilling officials of GDA and Smart Port City for maintaining the socio-economic development of local population, and diplomas for urban management, urban economics, and city planning are necessary for professional development of officials of this city

Skill trades for transport, retail and business start-ups, communication, and city consultation, skill trades for housing, commercialization, market analysts, businessmen, vendor, retailers, and whole sale dealers in according with socio-economic and metropolitan norms of the Gwadar Smart Port City.

Sea resort, tourism diplomas, disaster and risk management courses, diplomas of trade for Port city, diplomas and certificates for heritage sites and local culture, and skills for water supply, sewage and waste water disposal, solid waste management, storm water drainage, are also needed for making the first ever Smart Port City at the highest levels of provisions of municipal services in Pakistan.

**10. Bao Steel Park, Petrochemicals, Stainless Steel and other Industries in Gwadar:** The following TVET skill trades are recommended for job growth under this project in Baluchistan.

Technical skills trades for metallurgy, metal fixer, steel erectors, steel fixers, machine operators, technicians, construction works, machinery operators, cargo management, broilers, chemists, supervisor for reactors, laboratory to test metals.

Technical skill trades for tyre and tube making, petrochemical byproducts, rubber making, petroleum jelly making, and so on.

Technical skills for chemists like, extraction of metal, site specific chemists, technical inspectors, petrochemical diplomas, and other related TVET skills for steel sheet making and manufacturing.

**11. Development of Gwadar University:** Human resource development and its requirements for Baluchistan can be better and effectively started with the commencement of relevant general and technical education and trainings in the field of science and technology. The provincial labor force may be kept abreast with the levels of human capital formation of other provinces if the following educational opportunities are provided at the portal of Gwadar University to the local and youth population of Baluchistan.

In future, all the general and technical education and skills that would help in human capital formation of local people of Baluchistan particularly in Physical and Natural Science, IT, Management & Economics, Resource Management, Mining and Natural Resources, Local Gems & Jewelry, Marine Sciences, Engineering, and other subjects.

The Gwadar University must have CPEC center of Excellence for MoUs collaborations and joint ventures among all the stakeholders of CPEC, Federal government, Provincial government, Local people, Local investors, and Chinese investors.

The Gwadar University must establish Collaborative Centers of Excellence between Gwadar University and major high ranking universities of China for human resource development through exchange programs, R&D, and degree programs of joint ventures.

**12. Upgradation and Development of Fisheries at Coastal Areas of Gwadar Deep Sea Port:** Baluchistan occupies a big portion of total coastal area of Pakistan. It has one of the deepest sea ports in the regions. It has huge capacity of sea and fisheries products and byproducts to fulfill the water and sea based nutrition of people not only inside Pakistan but also to foreign sea food customers of the region. So, the huge sea food producing region and coasts of Baluchistan can be better developed with the provision of the following TVET trades related to fisheries and allied economic sectors of sea food, coastal and deep sea natural habitats for sea food production.

Diplomas and skills in big ships and vessel maintenance, vessel refrigeration system, vessel discharge system, vessel mechanics and electrical works, vessel engine repair and maintenance, vessel diesel technologies, shipboard electrical power installation, vessel safety, health and physical education, very specialized courses in deck, engine, navigation skills, vessel loading and stowage services, vessel crew, vessel safety and security, and vessel assistants.

Skill trades in fishing techniques of fish catching, fish preservation, fish and sea food technologies, fish tackling, sea food value chain and value addition, fish cleaning and handling skills, and vocational and technical skill trades in boat building, boat manufacturing, and boat making assistance, boat repairing, and ship righting.

Skill techniques in making small, modern, and technologically updated boat with plastic, wood, fiber glass, wool steel aluminum, and other ready mixtures and composites.

**Objective # 5. Conclusion & Policy Recommendations:** It is concluded that Baluchistan is the least developed province of Pakistan and yet has huge potential like Gwadar Deep Sea Port and abundance of unexplored natural resources that would lead the economy of Pakistan to the highest progression of socio-economic development once the economic potential of the province is utilized under the mega macroeconomic and global economic projects like CPEC. Human resource development is one the key factors necessary for socio-economic growth and it depends heavily upon human capital formation through investing in people and uplifting its human capitalism through TVET provision specifically according to the needs of CPEC projects in Baluchistan. In this regard, the following recommendations are put forth as policy recommendations for job growth and human resource development through identification of relevant TVET skill trades in the context of approved CPEC projects for Baluchistan.

1. It is recommended that the provincial capacity and scope for TVET provision must be enlarged for job growth and human capital formation in the context of CPEC projects.
2. Investment in TVET skill provision must be increased as per the needs and recommendations of UNESCO for skill development and SDGs for socio-economic development of local people in Baluchistan so that they are also included in the overall CPEC project and its socio-economic prospects in the future.

3. Strong collaborations and MoUs are needed among the provincial TVET departments, B-TEVTA, AVTTC, Skill Development Councils, Overseas Pakistanis Foundation, and other allied TVET departments and ministries for efficient and effective establishment of TVET system for the human capital formation of the provincial labor force.
4. Skill trades must be assessed with the given tentative skill list for each CPEC project by the officials concerned to that specific CPEC project and other stakeholders to specify the actual and potential needs of most relevant TVET skill trades that could not only fulfill the project based human capital needs and inputs but also work for job growth of the provincial labor force in future.
5. A three and/or four stayer strategy for human capital formation in line with the CPEC projects and its time length of early projects, short-term, medium-term, and long-term strategies in TVET skill provision is strongly recommended to be initiated for the unskilled labor force of the province.
6. Skill mapping for all the CPEC projects is strongly recommended that has strong likelihood to work effectively for job growth and human resource development in the context of CPEC projects in Baluchistan.
7. B-TEVTA must be made functional and independent authority with solving all its legal, administrative, collaborative, financial, authority related, and regulatory issues and problems that are pending with the allied TVET departments of province since 2011.
8. A scheme for skill development collaboration between China and government of Baluchistan is recommended to be established for those technical and vocation skill provisions that are not disseminated in Pakistan and those skills are needed for the CPEC projects of Baluchistan on priority and continuous basis.
9. A comprehensive skill strategy for CPEC projects in relevant skill trades is recommended for overall development of TVET system of Baluchistan so that it would work as one of the official skill documents (say) for the provincial government
10. A comprehensive way-out for future strategy is recommended for the apex CoE-CPEC to continue and follow the viable and feasible policy options of this study for better socio-economic prospects through skill development in the province.

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