Special Section 1: The Importance of Human Capital in the Context of CPEC

S1.1 Introduction

Pakistan has a total population of around 207.8 million as per the 2017 census, which is rising rapidly at an annualized growth rate of 2.4 percent. Similarly, the work force of the country has also been expanding, growing from 39.4 million in FY00 to 65.5 million in FY18 – an addition of approximately 1.5 million workers each year. This has been aided by the gradual increase in the share of youth (15-29 years of age) in the total population, which currently stands at 26.8 percent. This makes it an issue of national importance to facilitate the absorption of the work force in the labor market via job creation and skill-building. With the focus under China Pakistan Economic Corridor (CPEC) shifting towards agricultural development, industrial advancement, and technological investments, the country has an opportunity to gain on this front.

CPEC is expected to generate significant avenues of employment for the domestic labor force, especially after the establishment of the proposed Special Economic Zones (SEZs). However, as this development takes shape, the job requirements would gradually become more demanding. Accordingly, Pakistan needs to focus on improving the level of human capital in the economy so as to ensure that both the existing and the incoming labor force is skilled enough to meet the growing technical requirements of the evolving nature of work.

In this regard, this section intends to: (i) analyze the present state of the country's human capital; (ii) highlight the employment opportunities emerging for Pakistani workers under the next stage of CPEC; (iii) gauge the preparedness of the work force to maximize returns from these opportunities; and (iv) discuss some recommendations and recent developments to address the skill-deficit of the domestic labor force.

S1.2 The existing level of human capital development in Pakistan is low

In macroeconomic terms, human capital can be defined as the level and amount of abilities possessed by a set of individuals that can help increase labor productivity in an economy. Though education is generally considered a major determining factor in this context, aspects such as physical health, skill-set and societal attributes, etc. also influence the overall state of the human capital.

Recently, the World Bank introduced its Human Capital Index (HCI) in 2018, ranking 157 countries across certain variables to deduce the measure of human capital that a child born today can expect to attain by the age of 18. The index is

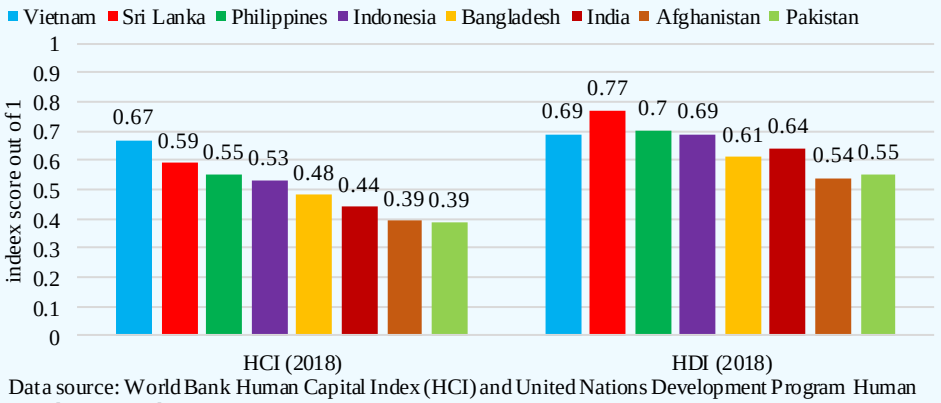
based on five education and health indicators: (i) probability that a child would survive to the age of 5; (ii) expected years of schooling of children; (iii) harmonized test scores as a measure of learning quality (to arrive at the "learning-adjusted" years of schooling); (iv) adult survival rate till the age of sixty; and (v) fraction of children under 5 years of age who are not stunted.

Table S1.1: Human Capital Index (HCI) 2018 and Ranking - Performance of Pakistan

Component	Boys	Girls	Overall	Ranking#
Survival to Age 5	0.92	0.93	0.93	142
Expected Years of Schooling	9.5	8.1	8.8	127
Harmonized Test Scores	335	343	339	145
Learning-Adjusted Years of Schooling	5.1	4.4	4.8	134
Adult Survival Rate*	0.82	0.86	0.84	93
Not Stunted Rate**	0.52	0.58	0.55	103
Overall HCI	**0.39**	**0.38**	**0.39**	**134**

Data source: World Bank
Rank out of 157 countries
*Data available for 156 countries; **Data available for 109 countries

Figure S1.1: A Regional Performance Comparison in Human Capital and Development Indices



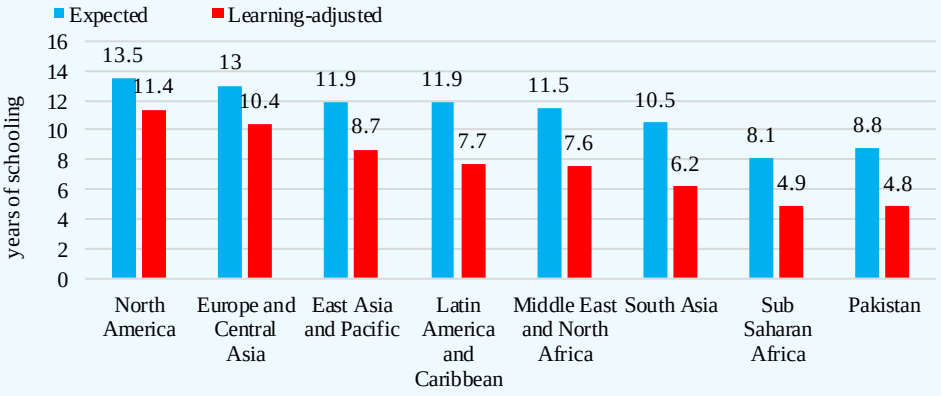
Data source: World Bank Human Capital Index (HCI) and United Nations Development Program Human Development Index

In overall terms, Pakistan ranks 134th out of 157, scoring lower than both its regional and peer economies. Component-wise performance is also poor, with Pakistan faring unsatisfactorily against all the indicators (**Table S1.1**). The findings are in line with the United National's Human Development Index (HDI) (**Figure S1.1**). According to 2018 HDI rankings, Pakistan ranks 150th out of 189 countries.

Coming back to the findings of the HCI, it is worrying to note that the average expected years of schooling for children in Pakistan is 8.8 years, ranking 127 out of 157 countries. The finding that exacerbates the problem, however, is that the level of "learning-adjusted education" - the number of years that the attained

education is actually worth in terms of quality (this is done so using standardized test scores across countries) - is estimated to be around 4.8 years for the children enrolled in Pakistan, the lowest when compared to regional averages (**Figure S1.2**). This results in the learning gap in Pakistan of 4 years being significantly higher than the overall world average of 3.3 years.

Figure S1.2: Learning-Adjusted Education - A Comparison



Data source: World Bank Human Capital Index (2018)

The national Education Survey conducted by Alif Ailaan, a not-for-profit private sector institution in Pakistan, for 2013 (the latest survey available) shows that Pakistani citizens are concerned about the shortage of quality education avenues available to them. About 45 percent of the respondents termed the state of education quality in the country as "poor", with 49 percent fearing that the students are resultantly falling behind those belonging to the neighboring countries. Furthermore, 65 percent of the participants stated that the low quality of education in the country is resulting in the poor economic performance of Pakistan compared to other countries.

Table S1.2: National Estimates of Out of School Children (OOSC) by Level of Education

Level	Age Group	Population	Enrolment	OOSC	OOSC (percent)
Primary	5 to 9	22,670,715	17,574,849	5,095,866	22.5
Middle	10 to 12	12,781,300	6,119,197	6,662,103	52.1
High	13 to 14	8,520,866	2,835,326	5,685,540	66.7
Higher secondary	15 to 16	8,934,989	1,356,825	7,578,164	84.8
Overall	5 to 16	52,907,870	27,886,197	25,021,673	47.3

Data source: Alif Ailaan. 2014. 25 Million Broken Promises: The Crisis of Pakistan's Out-of-School Children. Islamabad: Alif Ailaan.

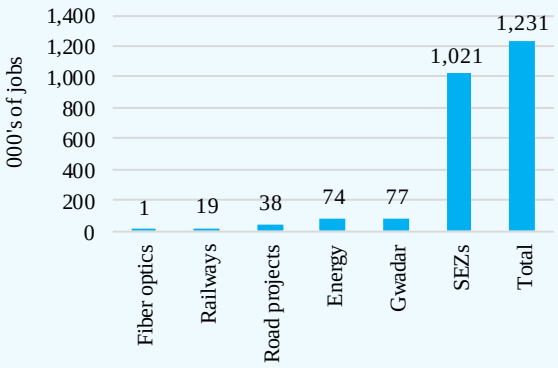
It is important to note that the indices referred above do not take into account the proportion of out of school children in a country while measuring the level of human capital or development. Worryingly, in the case of Pakistan, around 25.0 million children between the ages of 5 and 16 are out of school, equivalent to 47.3 percent of the total school-age population, with the levels increasing as the point of reference in terms of level of education rises (**Table S1.2**).

S1.3 The incoming labor force would face increasingly higher skill and knowledge requirements under CPEC

On November 4, 2018, a joint statement between Pakistan and China on "Strengthening China-Pakistan All-Weather Strategic Cooperative Partnership and Building Closer China-Pakistan Community of Shared Future in the New Era" was released. It officially signaled the commencement of the next stage of development under CPEC, with emphasis shifting from energy and rail/road infrastructure towards the fields of industry, agriculture mechanization, tourism, high-tech finance, port development and digital and technological advancement.

With the first stage of the CPEC already in near-completion, gauging its impact in terms of employment is now possible. According to a recently published working paper by the CPEC Center of Excellence,[1] the various energy, road and rail projects have resulted in the creation of around 124,470 direct jobs across the country between FY15 and FY18. Encouragingly, the number is estimated to rise to 1.2 million by FY31 after factoring in the development of nine proposed Special Economic Zones (SEZs) (**Figure S1.3**).[2]

Figure S1.3: Employment Potential under CPEC from FY15 to FY31



Data source: CPEC Center of Excellence (2018)

[1] Rashid, S., Zia, M.M., & Waqar, S. (2018). *Employment Outlook of China Pakistan Economic Corridor: A Meta-Analysis*. CPEC Center of Excellence. Working Paper 21.

[2] International Labor Organization envisages generation of 400,000 jobs in Pakistan due to CPEC, while the Applied Economic Research Center in Karachi puts the number at 700,000 between 2015 and 2030. Ministry of Planning Commission, meanwhile, expects CPEC to generate around 800,000 jobs over the next fifteen years.

However, the study also finds that the ratio of Chinese to Pakistani workers during construction and operational phases of some of these projects stood at 58:42 and 37:63, respectively.[3] While it is common for Chinese firms to bring along substantial number of workers from China (as has been the case in other Belt and Road (BRI) countries, such as Sri Lanka and Bangladesh), at least a part of the reason of a large share of the Chinese workers in Pakistan can be explained by the shortage of medium to high-skilled workers in the domestic market.

Table S1.3: Sector-wise Distribution* of Potential Jobs under CPEC

Sector	Low-Skilled	Medium-Skilled	High-Skilled
Agriculture	Sowing; cultivation; logistics; fish catching; storing; security guarding; packaging	Machinery installation; information dissemination via electronic means; operating refrigeration systems; fish preservation mechanisms	Processing machineries; supply chain tracking and monitoring; R&D; experimentation and demonstration centers; implementing water preservation mechanisms; development of e-agri applications; training
Industry	Packaging; basic processing; equipment fitting and fixing; procurement; manual labour; security guarding	Assembling; Machine installation and operations; advanced technical works	R&D; petrochemicals (advanced cracking, etc.) and pharmaceutical operations (drug related research); marketing; skill-building; managing; training
Services	Transportation; hospitality; basic plumbing, carpentry and electricity works; security guards	Tour guides; port machinery and electricity installments; machine operations; big ship vessel maintenance engine repairing; language skills; electronic supervision	Complementary services (accounting, legal, advisory, consultancy, etc.); digital finance and insurance; ICT port engineering (heavy machinery usage); tracking systems; medical; e-commerce; informatization; R&D; training; regulations

*Classification according to International Labor Organization's (ILO) skill-base definitions and the associated International Standard Classifications of Occupations 2008 (ISCO-08).

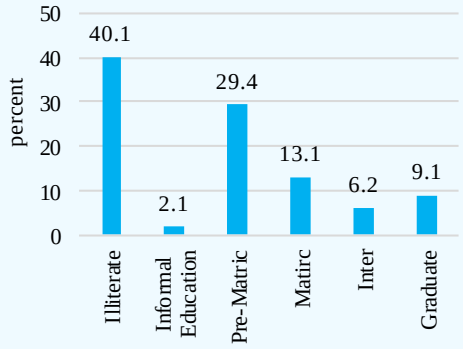
Worryingly, this deficit may further widen going forward as the focus shifts towards more knowledge-intensive fields such as digitization/mechanization of agricultural processes and joint ventures in financial and technological sectors of the economy (**Table S1.3**).

(i) Inadequate education is affecting the skill levels of the work force

As **Figure S1.4** shows, of the total civilian labor force, 40.1 percent of the workers are illiterate; at the same time, 74.5 percent of the literate workers have education up to the matriculation (Class-10) level only. Furthermore, the Annual State of

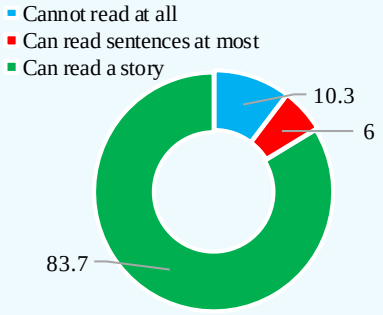
[3] Authors of the study take labor force distribution ratio observed under the construction and near-completion stages of Sahiwal coal power plant project as a benchmark for the analysis.

Figure S1.4: Civilian Labor Force by Education Status in FY18



Data source: Labour Force Survey 2017-18 and Pakistan Bureau of Statistics

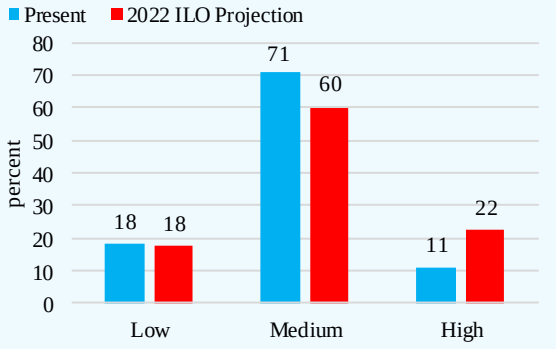
Figure S1.5: Percentage Distribution of Rural Area Class 10 students by Reading Ability in Urdu, Sindhi and Pushto



Data source: Idara-e-Taleem-o-Aagahi (ITA) 2016-State of Education Report

Education Report (ASER) for 2016, published by Idara-e-Taleem-o-Aagahi (ITA) in association with UK's Department for International Development (DFID) and Foundation of Open Society Institute (FOSI), reported that on average 10.3 percent of rural Class-10 students enrolled in schools all over the country could not read even a single word in Urdu and other regional languages (**Figure S1.5**). This unsatisfactory performance in the school results in the labor force not being prepared enough for the technically demanding jobs. At present, the Pakistani labor market is creating jobs requiring low, medium and high skill-sets in the ratio of 18:71:11, respectively, as per the latest labor force survey (LFS) statistics using International Labor Organization (ILO) skill group classifications. However, ILO projects the ratio to stand at 18:60:22 by 2022, further highlighting the need to train the work force to be prepared for relatively advanced jobs going forward (**Figure S1.6**).

Figure S1.6: Distribution of Occupations by Skill Requirements

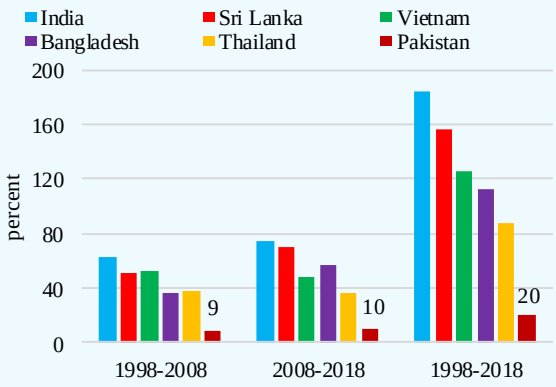


Data source: Labour Force Survey for Present; ILO for 2022 projections

(ii) Labor force productivity levels are also on the downside

As a result of the lost human capital potential, labor force of the country does not fare well in terms of productivity.[4] In fact, from 1998 to 2018, Pakistan has exhibited the lowest cumulative growth in labor productivity (20 percent) amongst all regional countries. For comparative purposes, India, Sri Lanka, Bhutan, Vietnam and Bangladesh all experienced labor productivity growth in excess of 100 percent during the same period (**Figure S1.7**).

Figure S1.7: Change in Labor Productivity Over the Last 20 Years



Data source: ILO

(iii) The work force fares poorly in terms of technical capabilities as well

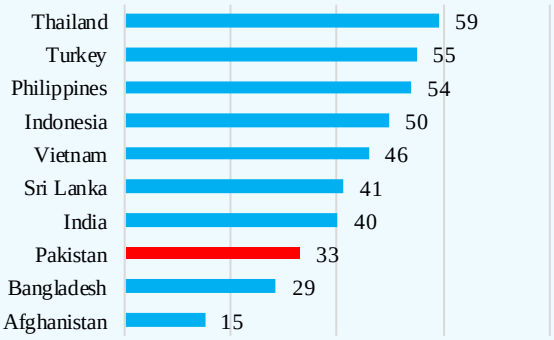
The next stage of CPEC is envisaged to bring substantial gains on the technology front. For example, laying down of 820 km long optical fiber cable (stretching from Khunjerab to Rawalpindi) is proposed to provide a fast and secure internet connection to the previously underserved segments of the society. The tech sector is also expected to benefit from the development of an IT park in Islamabad, as well as from training programs for the Pakistani labor force being rolled out by Chinese firms (like the Alibaba eFounders Fellowship Program for startups). Furthermore, after the establishment of the envisioned SEZs, the country is poised to experience technology transfers and spillovers, especially in the industrial sector.

However, the low level of human capital development over the past decades has resulted in Pakistan lagging behind comparable economies in terms of informatization - the extent to which an economy, or a geographical area, is becoming information-based (i.e. transitioning towards a knowledge-based economy). According to an index developed by the Chinese State Information Center in 2018, Pakistan ranks 54th in terms of informatization amongst the 64 countries that are officially deemed part of the Belt and Road Initiative (BRI)

[4] Note that factors such as persistently low capital investment levels and minimal gains from technological advancements (total factor productivity) over the years also played a part in keeping the overall labor productivity level in the country constrained. Source: Amjad, R., & Awais, N. (2016). Pakistan's Productivity Performance and TFP Trends, 1980–2015: Cause for Real Concern.

(**Figure S1.8**),[5] with an overall score of 33.0 out of a possible 100. This is indicative of severe supply and demand side constraints that are currently holding back the potential of the country's IT sector to develop and complement the growth of the economy.

Figure S1.8: BRI Informatization Index Scores of Selected Economies



Data source: State Information Center of China (Score out of 100)

Furthermore, the level of internet inclusivity in Pakistan is also below-par. According to The Economist Intelligence Unit's Inclusive Internet Index of 2018, Pakistan ranks 68th in overall terms amongst the 86 countries surveyed, with a mean score of 54.5 relative to the South Asian and world averages of 61 and 67, respectively (out of 100).[6]

S1.4 Policy recommendations and outlook

In conclusion, to maximize returns from the opportunities arising out of the implementation of CPEC projects, Pakistan would have to take serious notice of its human capital deficiency. The government needs to devise a framework focusing on skill-development of the workforce and adequate provision of associated services in order to stand on an equal footing with the rest of the regional economies, who are intently focusing on reskilling, digitization and technological advancements to gain a competitive advantage.

Firstly, a significant overhaul of the education system of the country is required to address the dearth of adequately skilled graduates entering the labor force. As the findings from the Human Capital Index reveal, the effectiveness of the primary education needs to be enhanced significantly in order to improve the level of knowledge-absorption and increasing the level of enrollment in schools. Of equal importance is the need for revising the curriculum of academic institutions to better reflect the needs of current and future occupations.

[5] The BRI Informatization Development Index ranks countries coming under the Belt and Road initiative along different indicators such as ICT foundation (GDP per capita, higher education enrollment, broadband speeds), ICT application (broadband and internet access levels), and ICT industry (export capacity of IT and IT-enabled products and services).

[6] For more details, refer to "Box 2.3: State of Internet Inclusiveness in Pakistan" in the SBP's Third Quarterly Report for FY18.

Secondly, focus on vocational and skills training of the work force is critical in ensuring that the employability levels of the domestic workers remain intact, or ideally increase, during the transitional stage of job transformation and technical advancement. A welcome development in this regard is that the Chinese firms are already involved in technical skill building of the Pakistani youth to enable them to be prepared for work under the CPEC programs. This includes emphasis on vocational training (such as the construction of Pak-China Technical and Vocational Institute at Gwadar), scholarships and exchange programs for university and college students as mentioned in the Joint-Statement, and collaborative efforts with Pakistani technological platforms (such as the AliBaba eFounders Fellowship program with NIC Karachi).

However, as stressed in previous reports, there needs to be an overarching policy to govern the skill-building process from the public domain to keep the progress aligned with the national objectives. The devolution of labor administration to provinces under the 18th Amendment, though, means that provinces must also facilitate the center in this regard. Recently, Sindh, Punjab and Khyber Pakhtunkhwa, all have launched labor policies with the objective of increasing jobs, providing a safe and healthy work environment, ensuring gender parity in employment, and training their respective labor force according to the needs of a transitioning economy.[7] This is an appreciable step, but it is important that these policies are also implemented in letter and spirit to actually realize the envisioned gains.

Another encouragement development is that the National Vocational and Technical Training Commission (NAVTCC) of Pakistan is in the process of introducing officially defined skill-set categorizations to help improve the placement and skill matching in the domestic labor market. Under the revised National Vocational Qualifications Framework (NVQF), an assessment criterion is being developed to classify workers according to skill-sets and to facilitate their gradual promotion to higher levels.[8] On parallel terms, the TVET (Technical and Vocational Education and Training) sector institutions would also be assessed based on indicators such as affiliation/accreditation with relevant bodies;

[7] The province of Sindh announced its "1st Sindh Labour Policy 2018" in February 2018, with KP following suit by approving K-P Labour Policy and a Child Labor Policy in May, 2018. The Punjab government passed its Labour Policy 2018 in November, 2018.

[8] The eight reference levels of the NVQF are described in terms of learning outcomes (LOs) under "Knowledge & understanding", "Skills", and "Responsibilities". They complexity of LOs are defined from basic knowledge, basic skills and working under the direct supervision (level 1) to advanced knowledge, specialist technical skills and supervision & management responsibilities (level 5). Levels 6 to 8 are assigned to bachelor and above level students and fall under the domain of the Higher Education Commission (HEC) of Pakistan.

adequacy of training facilities; teaching staff quality; type of trades being offered; employability of graduates; alignment with NVQF; and health and safety requirements, etc. The objective is to foster a sense of healthy competition amongst the training institutes to bring overall improvement in the sector.

Thirdly, on the technology front, the Digital Pakistan Policy released last year includes an optimistic blueprint for the enhancement of human capital via expansion of digitization in the country.[9] Emphasis on digital and financial literacy and inclusion would be vital to enable both individuals and businesses to take advantage of the ICT in e-commerce, Fintech and BPO segments of the market. Finally, a strong focus on higher-level education pertaining to the complementary services sector (such as accountancy, consultancy, legal, etc.) would be needed so that the domestic labor force can fulfil the associated requirements of new industries enacted under the proposed SEZs.

If implemented in an effective manner, these measures hold the potential to gradually improve the labor standards and provide the country with means to maximize returns from the potential opportunities arising both under CPEC and because of the rapid global shift towards knowledge-intensive and technology driven economic growth models.

[9] The listed objectives include: (i) focusing on ICT education to increase the knowledge base of the youth at par with the global standards; (ii) promoting innovation and entrepreneurship in the country; (iii) bridging the gap between industry and academia; and (iv) emphasis on increasing the local language web content to increase both the reach and relevancy of digital platforms for the masses.