



Reserach Article

Technological Disruptions, Youth Unemployment and Vocational Education Challenges in South Asia: A Short Report

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Abstract: The main objectives of the study have been to analyze the situation of youth unemployment and employment in South Asia, challenges of skills gaps and job opportunities for youth in the context of technological changes, and draw policy implications to address youth employment challenges by reorienting the technical and vocational education and training (TVET) to leverage youth employment potential in changing demographic-economic-technological dynamics of South Asia. The study has drawn the secondary data from the two major databases of the International Labour Organization and the World Bank. Data triangulation method has been used to select the relevant data and the short-listed data has been analyzed through simple descriptive statistics and deductive content analysis to evaluate the data more comprehensively and scientifically. Theoretical triangulation method has been used to support the conclusions drawn from the findings and to lower the threat of wrong interpretation of research outcomes by a deeper and broader analysis. In the South Asian region, youth unemployment rate (YUR) has been estimated at 18.8% in 2020, which is projected to increase to 18.9% in 2021. High youth unemployment levels in South Asia have been due to a lack of appropriate skills through the TVET than the lack of jobs. In South Asian countries, skills for work have been largely provided at secondary and tertiary levels through TVET programs besides non-formal training programs in public and private institutions, including employers, but still, the skills mismatches are huge in the context of new technological changes and innovations. Therefore, robust policy actions are needed to address the skills gaps and meet the youth employment challenges by reorienting TVET programs to ensure that the skills taught in TVET are demanded and valued in the labor market.

Keywords: technological disruptions, youth unemployment, vocational education, South Asia

JEL Code: J21, J24, J64, M53, N35

1. Introduction

Technological change refers to a change in a novel production function due to improvement in a product or process efficiency. Technological changes, including machine learning, digitalization of production, robotics and automated vehicles have profound effects on the labor market (Frey & Osborne, 2017; Brynjolfsson & McAfee, 2014; Ford, 2015) and raise issues regarding types of skills and learning required for occupations (McGuinness et al., 2019), which current

education systems are not adequately addressing for new entrants due to a disconnect in curriculums and requisite skills in occupations (Serdyukov, 2017). Youth not in employment, education or training (NEET) highlights the issue of exclusion of youth from activities considered to be positive for transition to adulthood (Maguire, 2015). High youth unemployment in developing countries is attributed to a lack of appropriate skills and experience than to a lack of jobs (Pieters, 2013). This paradox requires reorienting the education systems, specifically technical and vocational education and training (TVET) and work-based learning to bridge the skills-gap (Fletcher & Tyson, 2017). TVET is concerned with the acquisition of knowledge and skills for the world of work and includes education, training and skills development to meet the needs of occupations, production, services, and livelihoods (Kanwar et al., 2019), whereas work-based learning includes formal and informal arrangements, including apprenticeships, informal learning on the job, internships and work placements (Konstantinou & Miller, 2021).

Rapid technological progress provides immense opportunity for developing South Asian economies (Bingqin & Piachaud, 2019) to grow faster and attain higher income levels due to higher productivity growth driven by employing more workers through increasing skills complementary to technology, including digital skills and high-level cognitive skills and soft skills (Bertani et al., 2020; Sima et al., 2020). However, the existing skills-gap may constrain technology adoption and creation of new jobs (Prettnner & Strulik, 2020). Therefore, adequate policy options are needed to address the challenges of technology adoption risks, skills mismatch and creating job opportunities involving governments, regulators, the private sector, and international organizations. In this context, TVET can offer training in new skills for promoting youth employability and employment in South Asian countries. With the above backdrop, the paper intends to present a short report on technological disruptions, youth unemployment and vocational education challenges in South Asia.

2. Review of literature

Rapid technological change (Brynjolfsson & McAfee, 2014) and innovations (Gordon, 2012) have a significant impact on the quantity and quality of jobs (International Labour Organization (ILO) 2016a; 2016b). New technologies could potentially displace human labor and increase technological unemployment, which can be more worrisome in many emerging and developing Asian countries where labor forces are rapidly increasing and youth unemployment is rampant. New technologies are encroaching on many human tasks and led to capital-labor substitution (Chandy, 2017). Technological growth could itself be affecting the mechanisms by which increased income translates into increased labor (Brynjolfsson & McAfee, 2014).

Different countries in the Asia-Pacific region face different effects of technological change due to differences in demography, workforce skill levels, or availability of safety nets (Chandy, 2017). The current technological change could outpace the ability of the large workforce to re-educate and retrain (McKinsey Global Institute (MGI), 2017a) and unable to create labor demand (Susskind & Susskind, 2015), while the potential of automating occupations is likely to be huge (Frey & Osborne, 2017) in developing countries (World Bank, 2016) where some occupations will disappear and many occupations will be largely transformed (MGI, 2017b).

Disruptive technologies have labor-replacing potential (ILO, 2015a), as well as job creation potential (Kucera, 2017), with net positive employment effects (Nübler, 2016). However, Decanio (2016) reveals that current technological progress in robotics and automation will lead to net job losses in low-and middle-skilled administrative and routine jobs (Chandy, 2017). Automation is not expected to replace entire occupations, but only some human tasks and might also cause jobs re-shoring, reduce labor-cost advantages and lead to a displacement of employment from developing to developed countries. Automation of routine and repetitive labor-intensive work will impact employment generation for young workers (United Nations Conference on Trade and Development (UNCTAD), 2016), which is likely to affect nearly half of jobs globally and two-third of jobs in developing countries (World Bank, 2016) compared to only around one-tenth of jobs in Organization for Economic Cooperation and Development (OECD) counties (Arntz et al., 2016).

The services sector is most affected by automation and likely to experience significant job losses instead of job creations due to computerization of office and administration jobs and service and sales occupations (Frey & Osborne, 2017) with exception of jobs requiring human interaction such as elderly care and education (Finkel, 2017). The transportation sector is facing a high risk of job losses due to the rapid development of self-driving cars and trucks. The manufacturing sectors such as electrical appliances and electronics, textile, clothing and footwear are highly susceptible

to automation in emerging Asian economies (ILO, 2016a). The application of Internet of Things and other future agricultural technologies need less labor. Besides, the Blockchain (BC) technology will significantly affect the financial market and replace traditional jobs (McKinsey & Company, 2017).

The changing technologies offer new job opportunities (World Economic Forum (WEF), 2016; WEF, 2017; Atkinson & Wu, 2017). Technological change may increase job opportunities in the service and manufacturing sectors by creating demand for local service occupations (Mann & Puttmann, 2017). The impact of technological change had been more transformative on productivity and employment than the digital revolution (Gordon, 2012).

Besides technological advancements and innovation, climate change, green economy and demographic shifts are key drivers of new jobs in the future in Asian countries (ILO, 2017a). The transformation to a greener economy might impact the future jobs market (ILO, 2015a; 2017a). High-energy intensive sectors are expected to reduce jobs and net employment change is likely to be positive in traditional non-renewable energy sectors (ILO, 2013a; 2013b). New jobs are also likely in greening the economy (International Organisation of Employers (IOE), 2017). However, every degree Celsius of global warming will cost 1.2% of the gross domestic product (GDP), which is expected to downsize employment prospects (Wallace-Wells, 2017).

Demographic change is also expected to create new jobs in old-age care sectors (World Health Organization (WHO), 2016). New jobs are needed to achieve universal health by 2030 with a higher share of jobs in Asia and Pacific (Scheil-Adlung, 2016). Job churn is likely to worsen gender imbalances. Men face higher job losses compared to women due to automation, but they are expected to recover more of these job losses compared to women (WEF, 2016). However, in Asian countries women are more vulnerable to unemployment than men due to automation (ILO, 2016a). Besides gender differentials, generational differences are also notable in labor markets. Young workers have comparative advantages in using computers compared to older workers.

In the recent past, there has been a substantial increase in non-standard forms of employment (NSE) confined to temporary employment, part-time work, short-term agency work and dependent self-employment (ILO, 2016c), which leads to erosion of firm-specific skills thereby limiting their ability to respond to dynamic market demand (ILO, 2017b). Besides, demand for flexible work and middle-skills are increasing in the platform economy, which is likely to increase self-employed and contingent workers (Schmidt, 2017) on free-lance or temporary assignments (WEF, 2017). These workers are less likely to receive on-the-job training, thereby negatively affecting their career development (ILO, 2017c). Besides, very limited on-the-job training to workers in most Asian countries restricts employment in small and medium-sized enterprises (SMEs) and informal sectors. There is inadequate investment in training by the SMEs due to high risk of pilferage of newly skilled employees to rival firms (Ra et al., 2015). Lack of supply of skilled workers with required skills increase unemployment and underemployment among youth (ILO, 2015b). In South Asia, youth underemployment is significant and remained equal to the employed youth (World Bank, 2013).

Skills mismatch refers to a divergence between the skills required by employers and the skills possessed by prospective workers. Skills mismatch are considerably high in South Asia than the global average. For instance, skills mismatch are grave and enduring in India. Indian firms faced immense difficulty in filling vacancies due to the non-availability of workers with the requisite skills. At the same time, there is persistent unemployment and underemployment among Indian youth with university education. Many youths with university education are unemployable due to a lack of technical and vocational skills required by the firms (Nayar et al., 2012). In South Asia, skills mismatch has also been reflected in low growth in real wages and productivity in recent years. Real wages have increased slowly compared to output per worker. Therefore, skills mismatch is not only linked to insufficient education, rather it indicates the failure of education systems to cater to the skills requirements of the labor market. The academic and TVET systems have failed to supply both hard and soft skills due to poor linkages between formal education and training and also inadequate on-the-job training in South Asian countries. It is likely that divergence between supply and demand for skills will increase unless education systems can supply the required cognitive skills in tune with technological development. Existing skills mismatch can significantly impact future competitiveness and economic growth, if the firms compromise by hiring workers with low or unmatched skills in view of skill scarcity, or keep the positions unfilled. Not only this, the availability of overqualified workers without compatible competencies for the labor market significantly contributes to emigration and brain drain (Sabadie et al., 2010).

The level and quality of education determine technological skills required in the labor market (Schwab & Sala-i-Martin, 2013). Human capital strongly determines the application of information and communications technology

(ICT) (Lee, 2001) and workers' productivity in labor market (Dutz & O'Connell, 2013). Foreign direct investment (FDI) stimulates research and development (R&D) investment and consequently contributes to technology diffusion (Lee & Francisco, 2012). Shortage of skills acts as a significant hurdle to private sector investment and inadequate skills among the educated labor force acts as a major barrier in employability (Nayar et al., 2012). An increase in high-skill industries requires highly skilled labor force (Heckman et al., 2006). Quality of schooling determines the quality of labor force (Barro & Lee, 2015; Hanushek & Woessman, 2012). Motivated teachers not only impart knowledge but also develop cognitive and non-cognitive skills of learners (Hanushek et al., 2009). In South Asia, poor student achievement can be attributed to the quality of school education and teachers (Dundar et al., 2014).

In South Asia, qualified TVET instructors are very limited. Public investment in skills training is inadequate. Private sector involvement in skill training is scarce. TVET systems failed to address the skill needs in the rapidly changing labor market. Youth employability is low due to skills mismatch. Underemployment and open unemployment are pervasive in South Asia. Even the majority of employed workers in informal sector earn low wages. Therefore, underemployed as well as unemployed youth need to be skilled. The workforce with formal vocational training is small. Similarly, on-the-job training is limited. All this calls for strengthening formal vocational training, recruiting trained vocational instructors, and facilitating on-the-job training. It is estimated that 90% of new jobs need vocational skills in India (Okada, 2012). At the same time, the vocational education system had remained weak (Mehrotra, 2014). A negligible proportion of the workforce has acquired TVET skills (Panth, 2013).

Higher education contributes considerably to technological development. However, firms remained dissatisfied with the hiring of fresh engineering graduates due to inadequate quality of skills (Blom & Saeki, 2011). The quality of tertiary graduates remained low in South Asia due to low quality education, limited public investment in the TVET system and regulatory capacity and lack of dynamism to adjust to the changing demands of the industry. This results in a rapid increase in youth who are termed as NEET (Asian Development Bank (ADB), 2013). Technical education significantly improves the probability of employability of youth than graduates with only general education (Mehrotra, 2015). The contribution of the industrial sector in total employment has remained low in India, Bangladesh, and Nepal since the 1990s due to structural economic reforms. South Asia experienced premature growth in the services sector without adequate growth in the manufacturing sector, which hampered technological improvement due to low human capital. SMEs engaged in manufacturing and services provide most of the employment in South Asia. Most of the SMEs are unorganized and informal with limited capacity to provide on-the-job trainings (Mehrotra et al., 2013). Informal workers have inadequate access to skills development. Therefore, the governments should facilitate the transformation of informal economy into formal economy. Governments should also support the private sector in providing on-the-job training to equip the workforce in basic and generic skills including entrepreneurial skills.

Unemployment rates are lower for higher-skilled people compared to low skilled people (Bell & Blanchflower, 2011). Youth without proper training and skills face persistent long-term effects of unemployment (Scarpetta et al., 2010). In the future, managing transitions to new qualifications and skills are essential in the labor markets to fill existing jobs due to technical skills-gap and communication, teamwork and other soft skills (ILO, 2017b). Job churn is likely to increase skills gap and geographical mismatches, which will hamper job creation prospects (ILO, 2013a) due to mismatches and barriers in skills mobility (MGI, 2016). Therefore, robust policy measures can correct skills mismatches.

TVET has the potential to address skills mismatches through educational reform, vocational training and lifelong learning (ILO, 2015b). TVET has positive effects on youth employment in developing countries (Attanasio et al., 2011) with higher returns than academic education (Agrawal & Agrawal, 2017), which serve as a safety net in case of dropouts (Kahyarara & Teal, 2008). Employer involvement through internships and the development of curricula ensure the relevance of training in the labor market (Glick et al., 2015), which is difficult to obtain (Goldin, 2015). On-the-job training equip the workers with industry skills, which raise firms' productivity, increases workers' output and firm-level wages (Saraf, 2017). Despite its potential benefits, very less proportion of young workers receive workplace training (Roseth et al., 2016), specifically by youth with an incomplete education, limited skills, or short employment tenure (Cabrales et al., 2014).

In brief, TVET is a determining factor for a successful transition into the labor market. However, existing research studies have not given due attention to analyzing youth unemployment and employment in South Asian developing countries and the role played by TVET in improving the necessary skills to expand youth employment in the context of

the recent development in technologies and innovations. Therefore, current paper is an attempt to fill the research gap in this direction by analyzing the situation of youth unemployment and employment in South Asian developing countries and challenges in skill development and opportunities thereof, for finding effective ways to equip youth with skills and to realize their potential.

3. Materials and methods

Based on the research gaps identified through the review of literature, the present paper has addressed the following research questions: What is the current economic landscape in South Asia determining youth employment and unemployment in South Asia? What are the recent trends in the labor force, youth employment and unemployment in South Asia? What are the youth labor force participation rate (LFPR), employment-to-population ratio (EPR), and youth unemployment rate (UR) in South Asia? What are trends in the potential labor force (PLF), youth NEET and status of working poverty in South Asia? What are the challenges of skills gaps and how new technologies influenced job opportunities in South Asia and what are its policy implications?

In consonance with the research questions, the main objectives of the study have been to review the existing relevant studies with the goal to identify the research gaps, analyze the situation of youth unemployment and employment in South Asia, challenges of skills gaps and job opportunities for youth in the context of technological changes, and draw policy implications to address youth employment challenges by reorienting TVET to leverage youth employment potential in changing demographic-economic-technological dynamics of South Asia.

The study has drawn the secondary data from the two major databases viz. ILO (2020) and World Bank (2020). The data triangulation method has been used to select the relevant data and the short-listed data has been analyzed through simple descriptive statistics and deductive content analysis to evaluate the data more comprehensively and scientifically. The theoretical triangulation method has been used to support the conclusions drawn from the findings and to lower the threat of wrong interpretation of research outcomes by a deeper and broader analysis.

4. Results

The results of the study have been sub-divided into four sections viz. the economic landscape of South Asia, youth unemployment and employment in South Asia, challenges of skills gaps, and new technologies and job opportunities in South Asia.

4.1 *Economic landscape of South Asia*

In South Asian countries, the COVID-19 induced restrictions have heavily impacted the short-term economic activities including manufacturing, exports, and consumption. Industrial and service activities have declined sharply with the collapse of domestic and global demand. For instance, auto-manufacturing in India and Pakistan, and garment production in Bangladesh have been adversely affected due to a sharp decline in demand, which affected youth employment adversely. Business confidence and private consumption have been severely hindered in Bangladesh, India, Nepal, and Pakistan. The closure of SMEs has caused a huge decline in employment and private investment. Tourism declined sharply in Bhutan, and Nepal, which affects more than two-thirds of GDP in these countries and reduced employment. Governments induced fiscal stimulus and monetary measures cover health expenditure, social transfers and protection, credit support to SMEs and food security. Growth of GDP, consumption, investment, exports and imports in South Asia are shown in figures 1 and 2. Regional growth is estimated to decline by 8.2% in 2020 due to the pandemic impact on consumption and services and private investment shown in figure 2. In 2021, GDP growth is estimated to decline by 3.1% due to resumption in services and manufacturing in the region, however, a slow revival of tourism will affect the pace of economic recovery.

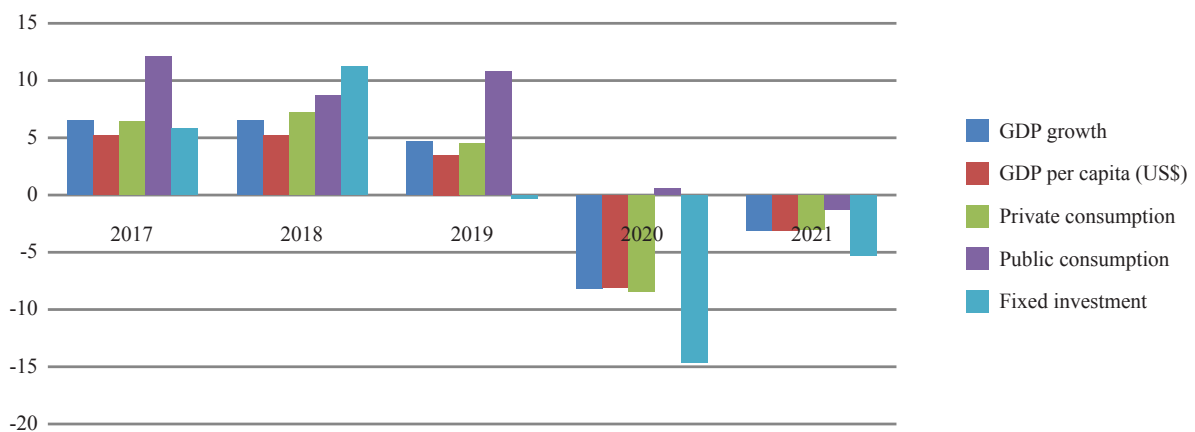


Figure 1. Growth of GDP, consumption and investment in South Asia (%)

Note: Data for 2019 are estimates and 2020 and 2021 are forecasts made in June 2020 and show percentage point differences from January 2020 projections
Source: World Bank (2020)

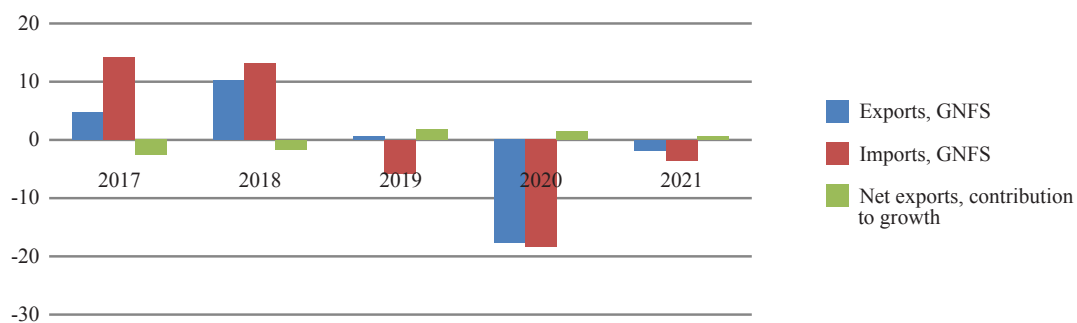


Figure 2. Growth of exports and imports in South Asia (%)

Note: Data for 2019 are estimates and 2020 and 2021 are forecasts made in June 2020 and show percentage point differences from January 2020 projections.
GNFS stood for goods and non-factor services.
Source: World Bank (2020)

Prior to the pandemic, financial markets and capital flows were rattled due to the global financial crisis and deteriorated more in large economies of the region. Real GDP growth at market prices in South Asian countries is shown in figure 3. In India, the growth rate has been estimated negatively at 0.8% in 2020 and projected to decline by 9% in 2021, despite fiscal stimulus and monetary easing. Pakistan and Afghanistan have experienced economic slowdown with growth contractions by 5% and 8.5% in 2020 and 3.2% and 2.5% in 2021 respectively. Bangladesh and Nepal have experienced a decline in growth due to a fall in exports and remittances, while supply chain disruptions and a sharp decline in tourism have impacted growth performance negatively in Sri Lanka. COVID-19 induced lockdowns have caused a severe decline in the performance of micro, small and medium-sized enterprises and a consequent rise in the level of unemployment, which has worsened the existing unemployment in most South Asian countries.

COVID-19 pandemic has severely affected the regional economy the most due to huge population, large informal sectors, high poverty and inequality, and high unemployment in vulnerable economies (United Nations (UN), 2020). Persistent disruptions in global financial markets, a surge in non-performing assets, inefficiencies, information asymmetry and high levels of debt are likely to adversely impact financial sustainability and thus reduce capital flows and investment and thus reduce employment across the region and limit the effect of fiscal stimulus. Despite limited integration into global value chains, inadequate intermediate inputs are likely to impact employment growth in the

pharmaceutical and textile sector in Bangladesh and the automotive industry in India.

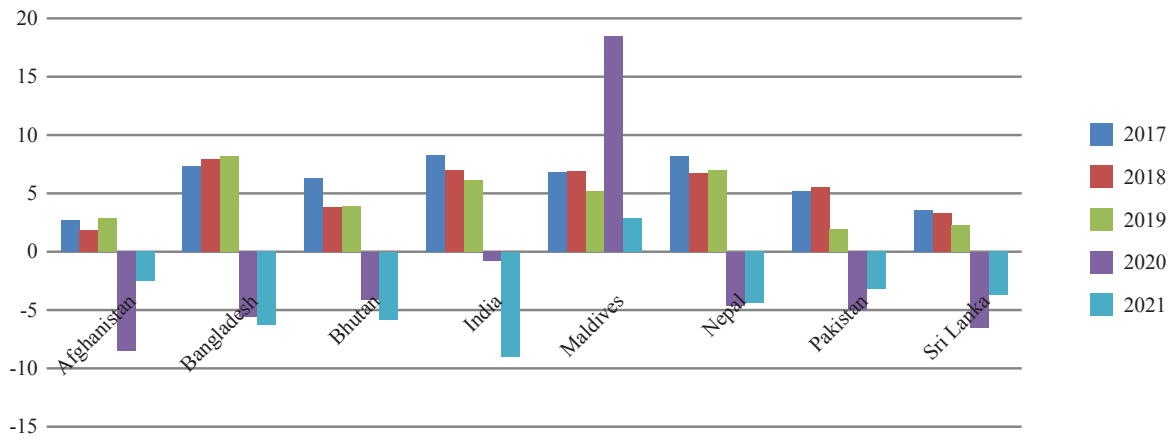


Figure 3. Real GDP growth at market prices in South Asian countries (%)

Note: Data for Afghanistan, Maldives and Sri Lanka refer to calendar year and for other countries based on fiscal year and data for Pakistan are calculated at factor cost. Data for 2019 are estimates and 2020 and 2021 are projections made in June 2020 and shows percentage point differences from January 2020 projections
Source: World Bank (2020)

4.2 Youth unemployment and employment in South Asia

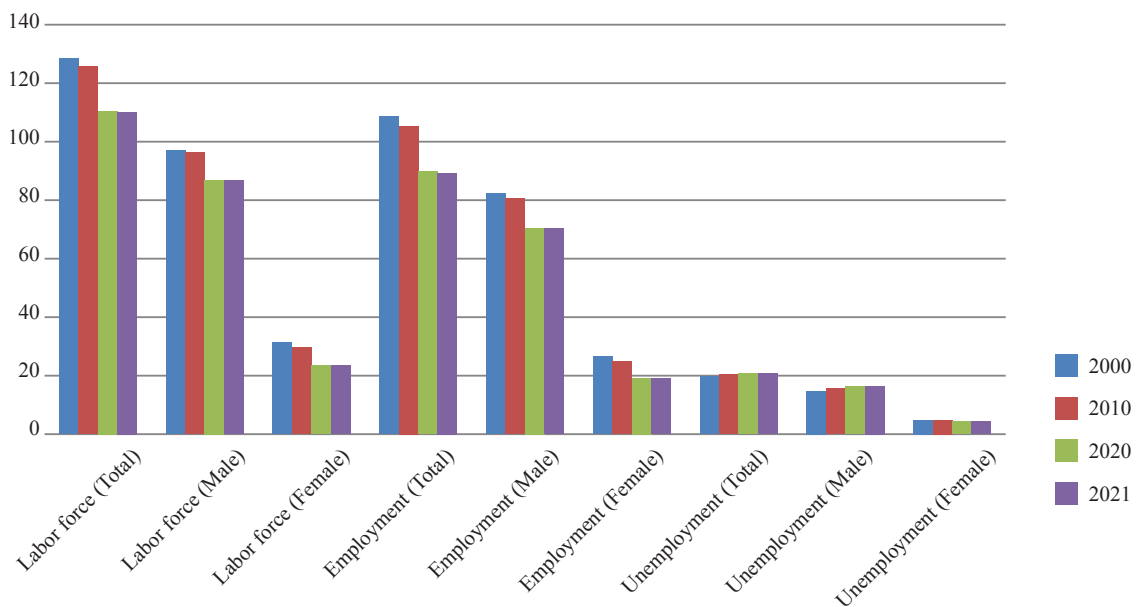


Figure 4. Labor force, youth employment and youth unemployment in South Asia, 2000-2021 (millions)

Source: Author's creation based on data provided in ILO (2020)

Figure 4 shows labor force, youth employment and youth unemployment in South Asia during the period 2000-2021. Total labor force as well as male and female labor force has declined, consequently the total youth employment and both the male and female employment have declined. Total youth unemployment has increased up to 2020 and

is projected to remain stable in 2021, while male unemployment has increased during 2000-2020 and is expected to increase further in 2021. Unemployment among females has decreased up to 2020 and is projected to surge in 2021.

Figure 5 shows LFPR, EPR, and youth UR in South Asia during 2000-2021. LFPR refers to the proportion of a country's working-age population engaged actively in the labor market, either by working or looking for work. EPR refers to the proportion of a country's working-age *population* that is *employed*. UR refers to the proportion of the labor force not in employment. In South Asia, total LFPR as well as male and LFPR has declined since 2000, and male LFPR has remained considerably higher than female LFPR. A similar trend can be noticed for EPR in South Asia. Employment growth has remained robust, driven by population growth and consequent increase in the working-age population. This resulted in slower decline in EPR. Between 2020 and 2021, South Asia is likely to experience a significant decline in employment growth. Higher EPRs reflect an abundance of workers who were driving force behind a rapid expansion of manufacturing and export-led growth in many South Asian economies. However, the majority of workers have not benefited from decent work and engaged in unregulated and unprotected conditions, and compelled them to live in poverty (ILO, 2018a). In South Asia, UR has increased throughout since 2000, and is projected to increase further in 2021 over 2020, due to a slowdown in economic activities across sectors and countries. A similar trend can be noticed for both the male and female population.

In South Asia, youth URs have remained higher than a global average due to structural barriers to enter the labor market (ILO, 2015c; UN, 2018). Therefore, South Asian youth should be facilitated to enter employment. Gender gaps in youth UR are quite small. URs for young women were slightly higher than those for young men up to 2010, however, the reverse is true for 2020 and 2021. The disparities in gender-based URs reflected social and cultural norms restricting women's access to employment, which are loosening over the period. However, female LFPR has been significantly lower than male LFPR. Therefore, the majority of young unemployed are male, even though the UR is higher among females.

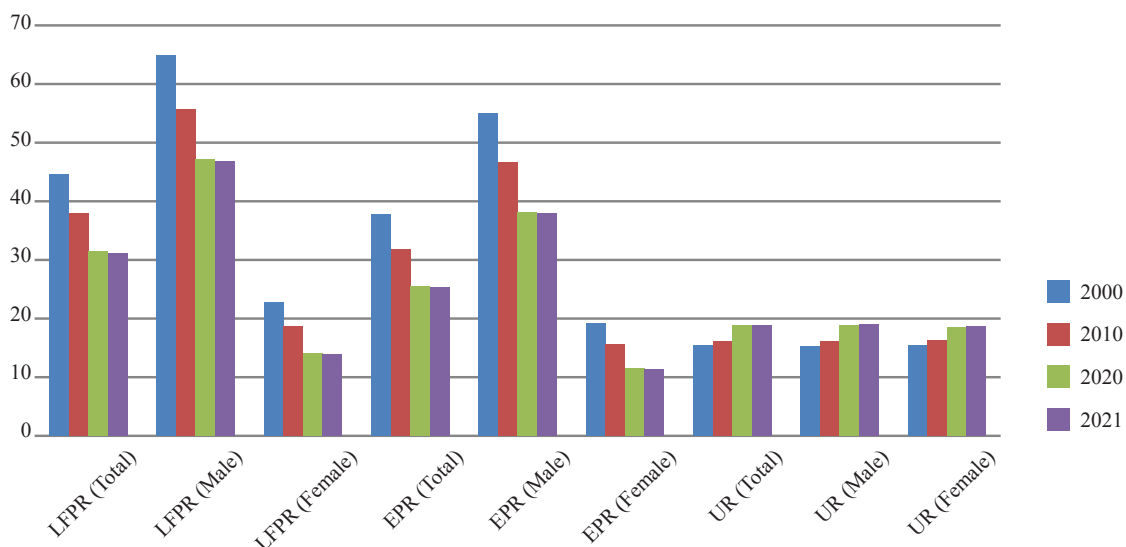


Figure 5. LFPR, EPR, and youth UR in South Asia, 2000-2021 (%)

Source: Author's creation based on data provided in ILO (2020)

South Asian economies must provide opportunities to tap the youth's full potential. The youth UR presented in figure 5 shows the explicit demand for employment. However, it fails to measure the full extent of labor underutilization (ILO, 2018b). The untapped labor outside of the labor force is also substantial in South Asia. The PLF includes youth NEET, who seeks employment but are not available to commence work instantaneously due to educational engagement, or available but not seeking employment due to dissuasion and non-availability of suitable jobs. However, unemployed youth are both available and looking for jobs and included in the workforce despite without work. The combined rate

of youth unemployment and the potential youth labor force is termed as LU3. It can be used as an additional measure of youth underutilization in the labor market. Besides, the NEET rate indicates the share of potential idle youth not in employment, education or training.

Figure 6 shows PLF, NEET and working poverty in South Asia during 2010-2021. PLF refers to “persons not in employment who express interest [in working] but for whom existing conditions limit their active job search or availability” (ILO, 2013c: paragraphs 40(b) and 40(c)). NEET refers to the number of young people not in education, employment or training as a percentage of the total youth population. Working poverty *refers* to employed persons living in households with a per capita income under \$1.90 (ILOSTAT, 2019). Total PLF and male PLF have increased between 2010 and 2020 and are projected to remain stable in 2021 for both males and females. The young people termed as NEET have increased significantly in the past decade and are projected to increase further in 2021. However, the population in working poverty has declined in the past decade and is projected to decline further in 2021.

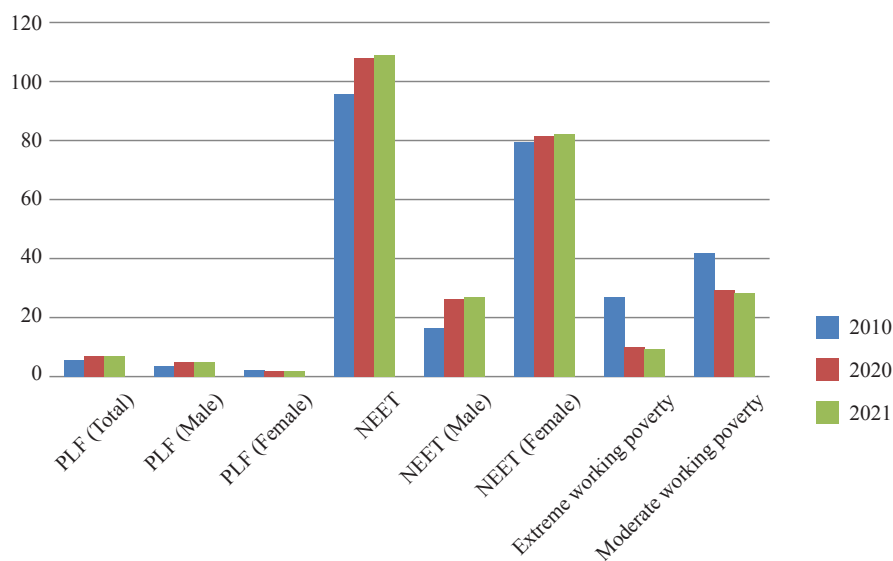


Figure 6. PLF, NEET and Working Poverty in South Asia, 2010-2021 (millions)
 Source: Author’s creation based on data provided in ILO (2020)

Figure 7 shows UR and PLF, NEET rates, and extreme and moderate working poverty rates in South Asia for the period 2010-2021. It is evident that UR and PLF have increased in the past decade and are projected to increase further in 2021 and the same is true for NEET rates, while the opposite is true for working poverty rates in South Asia. The divergence between demand and supply for labor is substantial for youth than adults in the South Asian labor market. In South Asia, the share of underutilized youth is 5:1 compared to 3:1 for the world average. Labor underutilization has reduced since the global economic crisis but surged since 2005 in South Asia, which affects young females more than young males. Youth’s higher enrolment in education reflects lower engagement in the labor market slow progress in addressing youth NEET challenge (ILO, 2019a).

In 2020, the estimated youth with NEET status stood at 107.9 million in South Asia compared to 267 million worldwide. This clearly reflects substantial youth underutilization and underlines significant challenges faced by South Asian youth. Youth NEET status indicates their inability to acquire the necessary skills compatible with demand in the labor market, which obstructs their future employment prospects (ILO, 2017d). The failure to secure a job disheartened the youth and makes them believe that suitable jobs ceased to exist for them. Therefore, there is an urgent need to reduce the share of youth with NEET status on priority. Gender disparity in youth NEET status is especially large in South Asia. NEET status of young women stood 3-4 times more than young men. Both the young men and women with NEET status face different challenges and therefore required different policies to address the challenges.

A significant proportion of youth are not looking for a job, which can lower the probability of job access in the

future. However, most unemployed are searching keenly to get a job in the labor market. This implies that most young women with NEET status are more likely to withhold NEET status due to domestic tasks (Elder & Kring, 2016). In South Asia, a significant proportion of employed youth are living in households below extreme poverty threshold, which implies that many employed youths and their families are unable to cross the extreme poverty due to intricacies between unemployment, low wage and decent work (UN, 2018). The delayed entry of youth into the labor market also indicates a likelihood of a better-skilled workforce in the future. At the same time, youth who have been able to secure a job also face the problem of quality of jobs. Young workers in the informal sector face immense difficulties to move out of poverty. Not only this, much of the potential of young workers remain underutilized, which is considerably reflected by the high LU3 including high NEET rates in South Asia. Development of new technologies viz. automation, robotics, artificial intelligence (AI), 3D printing, machine learning (MI), the Internet of Things (IOT) and blockchains have immense potential to address youth unemployment and working poverty in South Asia. The use of new cost-effective technologies can increase labor productivity and rapidly transform economies with an existing strong technology base.

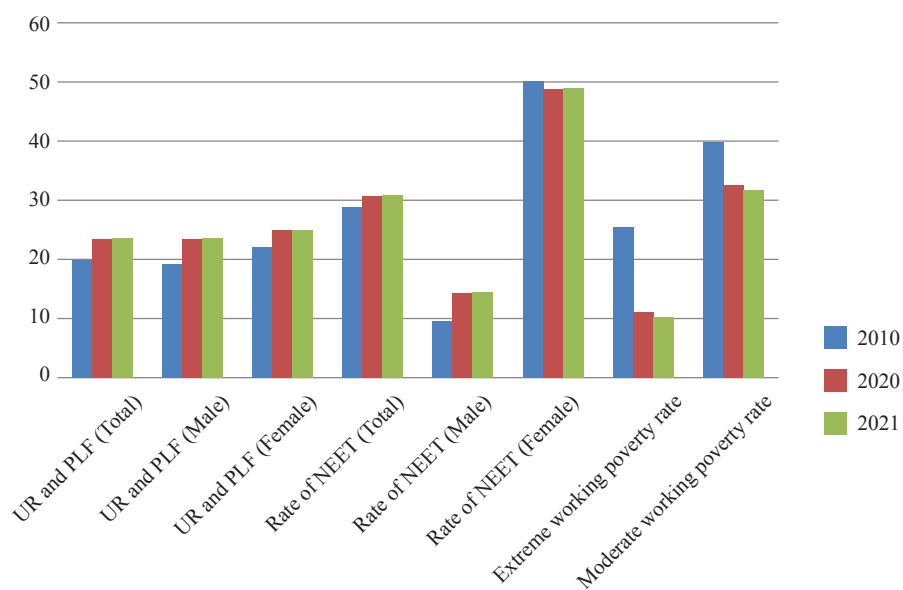


Figure 7. UR and PLF, NEET rate, and working poverty rates in South Asia, 2010-2021 (%)
Source: Author's creation based on data provided in ILO (2020).

4.3 Challenges of skills gaps in South Asia

All South Asian economies are facing significant challenges of skills gaps, which need to be overcome to support technological transformation (ADB, 2017). The challenges of skills gaps are diverse due to vastly distinct stages of development, policy objectives and institutional capacities (Unni, 2016). The quality of basic education to equip the school-leavers with strong competency in science, technology, engineering, and mathematics (STEM) skills is low to support a knowledge-based economy and economic transformation (Tan, 2018). Almost all South Asian economies face the constraint of limited institutional capacity and the inability of educational institutions to supply skills needed in the industry (Ra et al., 2015). Besides, skills gaps in the ICT, automotive, electronics, and tourism are large. The school-industry gap is a daunting challenge for developing an effective young workforce to support growth strategies. Most educational institutions lack effective consultation with relevant policy makers and industry. The exposure to industry experience is very low among instructors at various levels of educational setup. Likewise, students lack sufficient practical industry exposure through internship and on-site practical training (Patacsil & Tablatin, 2017).

The public sector entrusted with the task of meeting the skills challenges is facing fiscal constraint, while the potential of the private sector has remained under-utilized in meeting the skills challenges (WEF, 2016). In most South

Asian countries, students prefer a general academic degree compared to technical-or vocationally-oriented education, which persisted despite the shortage of skilled workers in technical and vocational fields, due mainly to the weak state of TVET education. In some South Asian countries, young workers have poor command of English language skills needed in the global marketplace, specifically in export-oriented and servicing including the information technology/business process outsourcing (IT/BPO) industry. Soft skills are often neglected in the national educational systems in most South Asian countries (Agrawal, 2013). Educational and training programs cater to entry-level jobs with little attention to lifelong learning and thus hamper the young workers' prospects of entering new growth industries. With economic restructuring, the skills gaps are becoming large in new digital and automotive technologies, which need to be bridged by a strong system of continuous and lifelong learning (UNCTAD, 2019).

4.4 New technologies and job opportunities

Technological change will impact both the quantity and quality of jobs (Kucera, 2017). New technologies will make agriculture more attractive to young workers. With aging population, the demand for young health and care professionals has been increasing faster. Automation in health administration may reduce employment, but leads to productivity gains and better services through improved electronic records, artificial intelligence, and machine applications. Along with increased employment of high-skilled young health professionals, demand for semi-skilled wage workers is likely to increase (ILO, 2017a). The use of new technologies in manufacturing has led to an increase in the use of robots, which will not necessarily displace humans but often complements them. New technology is likely to shift the demand for skills especially digital skills, computing, and machine ergonomics needed in manufacturing employment. Technological change in manufacturing calls for tapping the potential opportunities by skilling and re-skilling the youth through TVET for sustainable employment (Nübler, 2017).

Technological development in mobile technology, wifi, Internet, cloud technology and satellite communications affect youth employment in the transport and storage, information and communications sector significantly. Outsourcing has also been expanding due to lower wages, young skilled workers and large domestic markets in destination countries such as India. Young workers in other South Asian countries also need to seize future opportunities in technical and ICT skills along with complimentary soft skills, such as adaptability, critical thinking, problem-solving and creativity through TVET (Holtgrewe, 2014). Besides, medium-skill wage employment opportunities are also strong in South Asian countries, which need to be tapped for young workers through TVET.

Digital and automation technologies are widely used in trade, hotel and restaurant activities. In the future, increased technology adoption in trade, hotels and restaurants will need young workers with digital literacy including soft skills and interpersonal skills. However, much of youth employment is likely in semi-skills jobs, for which the role of TVET is not over-emphasized. Achieving the Sustainable Development Goal (SDG) 8 will be a major challenge, which calls for better standards of general education and vocation trainings for young women and men in tune with needs of new technologies. Therefore, there is an urgent need to tap emerging employment opportunities with the right skills, for which it is essential to revisit education and skills development systems through TVET along with approaches to lifelong learning.

Young workers must be well prepared to adapt to changing labor markets digitalization and automation. The growth of the platform economy presents new opportunities for young workers due to uncertain social and employment protections, and unstable work and income (ILO, 2016a). Younger crowd workers earn higher wages compared to older workers in the gig economy. NSE in the gig economy through appropriate regulation has the potential to provide decent work and flexible work hours, which can improve the work-life balance, greater independence and self-reliance. Education and training systems should be reoriented to impart right skills and attitudes for facilitating school-to-work transition by addressing the mismatch between education and training outcomes and labor market needs. Training and skills development strategies should equip the youth with both technical and core skills for higher employability and the TVET should improve the skills of young trainees to use them at work. There is a need to upgrade informal apprenticeship by improving the quality of training, reducing decent work deficits, and linking with the formal system. Labor market training is needed for on-and off-the-job training, apprenticeship and internship by focusing on job-specific technical skills and portable core skills in self-management, teamwork and communication.

5. Discussion

Demographic dynamics in South Asia reflect the youth unemployment trends. Youth bulge and a high proportion of youth in labor market contribute to a rapid increase in youth unemployment, despite the almost stable youth UR in 2020. The LFPR varies significantly in South Asian countries and has shown an uneven trend over the past two decades. For instance, Bangladesh and Sri Lanka have recorded LFPR of 58.3 and 54.1 in 2017 (ILO, 2018a). Gender disparities in LFPR are notable in South Asia, which stood at 27.6% nearly twice the global average due to socio-economic-cultural factors and contributes to the gender earning gap (ILO, 2016c) and likely to remain high in the near future. In Bangladesh, Pakistan and Sri Lanka, the ready-made garment sector in urban areas has provided women with opportunities to work and support family earnings. The attitudes and social norms are also important factors, if not the most important factor for low female LFPRs in South Asia. Women are less covered for social protection including unemployment benefits, pensions and maternity protection, which calls for concerted efforts to increase women labor market participation through comprehensive policies to reduce gender gaps in the labor market (ILO, 2016a; 2017b).

In South Asia, employment growth is estimated at 1.5% per annum in 2019-20. The UR has been estimated to remain static at 3.1% from 2017 to 2020 in South Asia, however, the unemployed population has been estimated to increase from 22.2 million to 22.9 million during the same period, reflecting a surge in the working-age population (ILO, 2019b). Unemployment growth in South Asia stood at 1.6% in 2018, which has been estimated to decline slightly to 1.5% in 2019 and likely to persist in 2020. The employment rate has declined in India since the global financial crisis, but increased in Pakistan and Sri Lanka, reflecting mounting job challenges for young job seekers. In 2019, the vulnerable employment is estimated at 72% in South Asia, of which women's share is more pervasive than men (ILO, 2018c), which is linked to slow the pace of structural transformation processes in South Asia. High rates of poverty force people to engage in some sort of livelihood-seeking activity in South Asia. There is a strong link between higher working-poverty rates and low URs in the region. For instance, the share of working poor among economically active youth in 2017 was about one-half in South Asia. South Asia faces the persistent challenge of overcoming poverty through work. In 2017, the trade-offs between decent work, unemployment, and low-income work stood at 71% in South Asia and 86% of their women remain outside of the economy (UN, 2018). Young South Asians face high poverty levels and a large informal sector. Jobs in agriculture are usually informal, with no benefits, protection, and subject to abuse.

The main hurdles to reduce youth UR in South Asian countries include demographic dynamics, labor market structure, lack of skills and insufficient job opportunities (ILO, 2017a). New technologies are also rapidly changing the employment prospects for youth. Skills mismatch hampers youth employment in many countries. Youth education, skills and professional experience determine their success in future labor markets, however, youth in the age group 15-24 is highly vulnerable in labor markets. Therefore, new technical skills and soft skills through TVET are essential for swift school-to-work transitions for youth-inclusive sustainable development. Skills mismatches pose strong challenges for the labor market. Unemployment inhibits the youth from acquiring job skills, thereby impacting their future employability, job efficiency and earnings. Therefore, youth needs to be equipped with education and skills to obtain productive jobs (ILO, 2014). Generally, youth experienced short-term unemployment after gaining education to secure suitable jobs in labor market. However, persistent unemployment is worrisome due to its significant adverse impacts on youth livelihoods in general and during the economic crisis in particular (ILO, 2019a). This unrelenting youth unemployment is attributed to limited work experience required for entry-level jobs, and their aspiration to access better jobs specifically for those who can depend on their families for financial support during a job search (UN, 2018).

Technological development has significant implications for youth employment. In South Asian developing economies, the access to TVET is very low and a very low proportion of urban and rural youth attend TVET institutions at the secondary level. Thus, the education deficit is not filled by TVET. It calls for equipping South Asian youth with necessary skills to transit from school to the labor market (ILO, 2019a). Early adopters of new technological skills can seize job opportunities. However, increasing automation risks and a decline in middle-skill occupations make the transition difficult. Therefore, the employment opportunities created by technological advances are not without associated challenges. Youth with tertiary education enters less automatable jobs than their counterparts with vocational training. Therefore, vocational training reduces the automation risks and increases job prospects in the labor market. However, vocational skills become outdated more quickly than tertiary education skills (Hanushek et al., 2017). In most South Asian countries, unemployment is largely due to difficulties in finding the first job, which calls for active labor market policies to support youth for successful school-to-work transition. Therefore, successful school-to-

work transitions should consider both supply- and demand-side constraints to the labor market using pro-employment economic policies including broad skills strategies and progressive active labor market policies.

6. Conclusion and policy implications

The present study is based on two major secondary databases viz. ILO (2020) and the World Bank (2020), which facilitated the cost-effective analysis of the research questions and drawing the inferences and policy implications. It can offer guideposts to other researchers to replicate, re-analyze, and re-interpret the existing databases to evaluate the new research questions and generate new knowledge. However, it is also evident that the used databases have been collected for some specific objectives and not for the research questions analyzed in the present study, which remains a major limitation. However, special attention has been made to ensure a match between the targeted research questions and the existing data through a careful and critical evaluation of used databases to shun the limitations if any.

In South Asia, youth URs remained high (ILO, 2012). For instance, youth UR in India stood at 10.1% in 2015 (ILO, 2018a), which is really worrisome as economic growth of 7% per annum failed to expand employment of the growing youth population (UN, 2018). The financially insecure youth entered into temporary, seasonal and part-time work (ILO, 2016d) and the informal economy provides more than two-third of employment (ILO, 2017a). In South Asian countries, youth UR is significantly more than adult UR and employment growth stood lower against economic growth and much of the employment growth was in the vulnerable and informal sector (International Institute for Labour Studies (IILS), 2013). Young jobseekers have remain discouraged without decent jobs due to the mismatch between the skills and employability opportunities.

A better understanding of the characteristics of young unemployed and their vulnerability is helpful to know why people find it difficult to get employed. The UR is highest among persons with secondary and tertiary education in most South Asian countries. In recent years, the UR with secondary education and tertiary education stood high, which seems to confirm that middle-skilled jobs are increasingly hollowing out, due to technological progress and use of information and communications technology (ICT) in routine tasks (ILO, 2018b). The least-skilled workers are most vulnerable to unemployment and can pose a serious barrier to future growth and well-being in South Asian countries. The UR is highest among tertiary graduates due to limited industrial diversification. Higher-skilled persons have high job reservations and are more likely to wait for the right job than accept any job. Unemployment among young students with tertiary education also reflects more concentration in humanities with lesser jobs compared to science, technology and care occupations due to lack of perfect vision on the future jobs. Even when young people have a clear vision of the labor market and study much demanded engineering courses, they face a glutted market or a market hiring from reputed institutions, thereby experience high URs. Besides pursuing education in tune with growth occupations due to new technological development, other supply-side constraints like the quality of education and technical skills gained through general education and TVET systems are relevant.

Achieving full and productive employment for millions of South Asian youth is a big challenge, specifically in the context of young workers' poverty, delayed labor market transition, and technological change. The understanding of youth labor market transitions and opportunities for vocational education is essential for shaping policies and programmatic interventions. The economic growth strategies in South Asian countries should be integrated with robust and comprehensive skills development strategies. The critical skills needed in key industries should be given utmost priority in skills training. Training strategies should also focus on future skills needs in new technologies, growth industries and green economy.

A holistic approach focusing on education and skills, employment and economic policies, labor markets, and youth entrepreneurship and self-employment policies is required to address youth employment challenges. Youth employment strategies and policies are essential for developing appropriate skills strategies to meet the needs of changing labor markets. The secondary and post-secondary education curricula should be reoriented to changing employment markets in tune with technological dynamics by investing in digital skills and competencies in the STEM fields and soft skills in creativity, imagination, and social and communication skills. Young workers with high-, medium- and low-skill levels need to train in core job skills in adaptability and social intelligence. Lifelong learning should be prioritized to address skills requirements in new technologies by reskilling and upskilling the young workers. In this context, national education and training systems have to play a prime role in fostering inter-disciplinary training, experiential learning,

and trans-disciplinary skill acquisitions.

There is a need to integrate the ICT into education, training and skills management at all levels through strong political and financial commitment covering broader occupational clusters. Future technological skills gaps need to be identified at the industry level, which needs to be addressed by reorienting the existing TVET, including higher education. Integrated ALMPs should address gendered labor market disadvantages and needs of young workers through tailored and complementary services such as on-the-job training, transportation and childcare allowances. Youth self-employment and entrepreneurship should be promoted by combining active labor market measures like wage subsidies and training targeted to startups including access to finance and advisory services. The digital start-ups should be promoted for young entrepreneurs by providing digital skills training.

The formal dual apprenticeship systems based on the ‘German model’ should be evolved in South Asian countries for equipping the youth with employable skills by active collaborations of government representatives and employers’ associations and unions in designing and implementing vocational training based on country specific labor market needs by assessing the existing pre-conditions and experiences, which needs robust organizational capacities of relevant players. On the job learning should be more systematic and bring school-based vocational training or general education closer to labor market needs by active participation of employers. University education should also be more labor market-oriented by including internships with employers, for which governments can fund public universities to modify academic curricula accordingly. The traditional or informal apprenticeships should be articulated better with the schooling system and the formal sector. Informal workers and employers should be encouraged to participate in informal apprenticeships with vocational schools run by non-government organizations or non-profit associations.

In some South Asian countries, piloting a “dual system” is also desirable for a systematic assessment to understand what works. In sum, TVET institutions should be supported by the government through generous finance and legislative measures in line with general education institutions. TVET curriculum should be revamped by including relevant on-the-job training, soft skills, entrepreneurship education and career guidance. TVET providers should promote lifelong learning and skills needed in new growth industries as well as dispersed to remote areas to increase access of disadvantaged groups in the ICT-based training. Public-private partnerships should be promoted to enable TVET institutions to expand their capabilities and improve the quality and relevance of their training for young workers.

In brief, South Asian youth faces immense employment challenges, which have increased with the risks associated with technological disruptions. New technologies create new jobs and also cause job losses and/or transformation of jobs. Young people are early adopters of new technologies. However, youth faces significant automation risks in a new labor market dominated by digital economy. Therefore, investment in digital infrastructure becomes essential to expand access to new technologies to promote jobs. Similarly, there is a need to increase investment in education and skills development by revamping education and training curricula to enable smooth school-to-work transition and working-life transitions. Education and TVET systems should be reoriented to equip the youth with labor market compatible skills including technical, digital and soft skills. TVET should provide up-skilling to young workers threatened by machines or automated processes in their jobs. TVET system should be integrated with on-the-job learning provided under dual training programs. Young workers who have been displaced by automation need targeted support for re-employment and not to become NEET. Besides technical skills, youth should be equipped with life skills to improve employability. Youth should also be equipped with skills in cyber-security, big data, quantum technology and machine learning.

The present study is not without limitations. An important limitation of the study includes the lack of comparative analysis of youth’s educational attainments, employment and unemployment and related variables by industry, age, and sex by country and years. This limitation remains due to delimiting the scope of the study and also offers researchers to cover these issues in future research. The study has also identified some unaddressed research questions, which can be answered in future research. How vocational training reduces automation risks and increases youth employment prospects? How vocational training based on a dual apprenticeship system facilitates the young transition to the labor market? What are the cross-country and sector-specific differences in automation risks associated with vocational training? How employment of young men and women are affected by automation risks? How formal and informal jobs are affected by automation risks? How entry-level jobs for young men and women are affected by automation risks? What are the career options for young men and women facing a high risk of automation?

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