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Competitiveness, Skill Formation, and Industrialization: The South Asian Experience

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1. Introduction

Global economy is steadily moving towards the fourth industrial revolution (4IR).[1] The 4IR is changing the nature of economic activities, organizations, businesses, institutions and the lives of the people across the globe (Schwab, 2017). Historical experience of the industrially advanced countries and more recently the newly industrializing countries of East Asia shows that the industrialization has remained the engine of economic growth and development. The industrialization has transformed the sources of livelihood of the people and sustained institutional changes. The spread effects of industrialization have also impacted the structural and institutional changes across the countries. The central dynamic force behind the industrial revolution has been epochal innovation (Kuznets, 1966) and each industrial revolution has its own distinctive innovation. The newly industrializing countries of East Asia also has unique innovations to catch up with the advanced countries (Lee, 2013). The technological innovations not only changes economic activities but also undergoes dramatic skill requirements. The technological innovations to succeed requires suitable institutional changes and human capital formation. Where these conditions are not fulfilled, the industrial revolution either has not happened or distorted economic development. However, the industrial revolution in some parts of the world do effect the rest of the world in several dimensions. Even with low level of development, the most of the developing countries are witnessing trend towards high-tech industrial development and that also reflected in terms of increasing share of trade in high-tech manufacturing commodities (UNIDO, 2015).

South Asian countries are also undergoing steady structural transformation of its economies in general and within industrial sector changes in particular that are determined by the pace of globalization. These countries host world's largest poor due to lack of innovations and stagnation of their industrial sector (UNIDO, 2015). The innovation system of South Asian countries is highly dependent on imported technologies. These technologies are neither suitable to the factor endowment of South Asian countries nor generates interlinkages across

sectors. Therefore, the spread of technology transfer benefits remains very limited. Lack of inter-sectoral linkages between sectors and economic actors push the system towards low productivity trap. The consequence of such deficiencies results into promoting rampant exclusion. Domestic base of human capital and technological capabilities are relatively weak. Resources devoted towards innovation are substantially low as per the requirement of the innovation system. The current model of science and technology policy adopted by the South Asian countries is highly centralised and need refurbishment on urgent basis while adopting decentralized approach. To overcome low productivity and poverty trap, the South Asian countries should devote adequate resources towards investing in human capital, institutions, improving innovation system.

In South Asian countries, the workforce either disguisedly employed or employed in low productive economic activities and do not match with the skill requirements for competitiveness of their industrial sector and thus results into mass poverty. To overcome the industrial stagnation and skill formation gaps, the South Asian countries needs to revamp their national innovation system for harnessing the ongoing industrial revolution and move onto the path of self-sustained economic development. This chapter is an attempt to explores the possibilities of industrial development and skill formation for making South Asian Countries more competitive in the era of fast changing global economy. It is divided into six sections. The second section examines economic theory and empirical literature emphasizes on the need for skill formation for industrial development and competitiveness. Third section analyses the nature of economic transformation of the Asian Countries. Skill mismatches of South Asian countries are identified in fourth section. The suitable strategy for overcoming the skill formation gaps and industrial development for South Asian countries is developed in fifth section. Concluding remarks are presented in the last section.

2. Theory and Empirics on Skills and Development

The endogenous theory of economic growth has argued that the skill formation plays an important role in raising the productivity of economic activities. Lucas (1988) has developed the model of economic growth with human capital accumulation and argued that long term economic growth is determined by the level of capital accumulation by the number years of school and also learning by doing. The level of skill has a direct effect on raising the level of productivity of the workforce. However, the indirect effect of schooling of the workforce is the spillovers or externalities that generates increasing returns to scale. The direct impact of skills on individual productivity results into higher returns to the workforce

but indirect effects generates increasing returns to scale and raise general level of productivity and are beneficial to the society at large. Both the effects combined together results into higher level of productivity and increasing returns to scale. Therefore, it is suggested that simple rise in the level of skills imparted through schooling has long term effects on economic growth of an economy. Thus, public policy of increasing expenditure on schooling can be the major instrument of enhancing productivity of human capital and long term economic growth.

In another variant of endogenous growth theory presented by Romer (1986) has put forward the idea of higher the level of expenditure on ideas generation (research and development expenditure) higher will be the long run growth. Romer has outlined his model while dividing the workforce of an economy into two parts. One part of the workforce engaged in usual economic activities and the other part is employed in producing new ideas. The accumulation of new ideas helps in generating new technologies/innovations that improves the arts of production and prevents diminishing returns to scale on capital. But susceptible to diminishing returns on the generation of new ideas. The overall impact of investment on generation of new ideas, while employing the scientific manpower, is reflected through generation of externalities that results into developing suitable environment of increasing returns to scale. This process generates boundless economic growth for the countries that has employed larger workforce in generating new ideas. Thus, an important public policy implication that results from this model of economic growth is higher the level of investment in scientific workforce and research and development, higher will be the level of economic development.

UNIDO (2015) has shown that the engine of long run growth and catch up is industrialization because industrialization generates the economic dynamism of structural change that sustain growth by increasing its episodes and reducing its volatility. The industrial development is driven by technological progress, which is imitated or adapted from the industrial advanced countries. This process requires domestic technological capabilities that are further based on the capabilities developed by the national innovation system. The capabilities development is fundamentally based on education of the workforce and the allocation of human capital and investment in research and development (R&D). To bridge the gap of technological knowledge and move on the process of catch up, the developing countries are required to develop absorptive capacities. It is significant to note that the determinants of absorptive capacities are continuous investment in human capital. As the industrial development of the developing economies is in transition and becoming

increasingly more technology intensive. Thus, it is important for a developing country to reap benefits of this manufacturing transition while investing in generating skilled technicians, scientists and engineers. The absorptive capacities and capabilities are fundamentally determined by the well-functioning national innovation system.

Jagannathan and Geronimo (2013) has examined the relationship between skills development and industrial competitiveness across Asia-Pacific economies. The authors have identified the phase of transition across developing countries and their changing skill requirements for enhancing competitiveness of industries across the developing countries. It is recognized that skill credentials developed and endorsed by industry are crucial for preparing workforce to be shifted from school to work. Skill imparting institutions should take care of the range of industries and their skill requirements. As the technology improves, it opens up a window of opportunity for high value added industries and thus requires knowledge workers that enable industries to achieve high productivity on sustainable basis. It is asserted by the authors that skill improvements are also required for increasing intensity of services in the Asian countries. This also requires a massive investment in education of the workforce for attaining competitiveness in knowledge intensive services and support to the industry for in house training of the workforce to avoid redundancy of the employed workforce.

Fourth industrial revolution (4IR) driven by new technologies and fast pace of globalization is dramatically changing the existing model of business across all sectors. The emerging models of economic activities increasing the speed of job destruction and job creation. WEF (2016) estimates show that the half the number of jobs are at risk because of automation. Furthermore, it is estimated that the automation will destroy 9% jobs even in the low value added occupations. The risk of non-automatable workforce employed in economic activities is also very high and a one-third of these jobs may be destroyed by 2020. On the contrary, the educational institutions have been imparting training to the population that is soon expected to be redundant or there will be no new employment demand. It is estimated that 65% of the school going age children are receiving education for jobs that does not exist today or are receiving education and skills that will not allow them to join jobs due to skill gaps. It is thus suggested by the report of WEF (2017) that as the 4IR is unfolding, there is a strong need for increased investment in human capital formation so that benefits of emerging technologies can be widely reaped. To achieve inclusive and sustainable industrial development there is a need to fill the double gap, that is, mismatch between the emerging economic activities and human capital and within human capital male-female skill gaps.

Beyond this it is suggested that mind set change is required both at institutional level as well as at individual level to move towards adoption of life-long learning culture that provides life-long employability and career security.

The foregoing brief review of studies allow us to conclude that the changing economic environment of productive economic activities generates skill mismatch. It is true for both developed and developing countries but skill mismatch is relatively more severe in the case of developing countries as compared to the developed countries. Moreover, the capability to tackle the skill mismatch is quite weak in the developing countries compared with the developed countries. South Asian countries are at higher risk in this context and therefore require urgent actions to address the skill mismatch in the foreseeable future to remain competitive and enable the population for sustainable livelihood.

3. Economic Transformation of South Asian Countries

Changes in the economic structure of an economy is the indicator of the direction in which the country's economy is moving. The process of modern economic development can be reflected from the structural transformation of the economy. The changing structure of an economy also effects the institutional arrangements and ideology. These changes are driven by the unique innovations and economic activities shifts towards higher level of productivity and wages (Kuznets, 1966). The growth experience of South Asian countries and also of the region are presented in Table 1. The average annual growth rates of GDP and three sectors, that is, agriculture, industry and services, based on 2010 constant prices for the period 2000 to 2016 shows variations across South Asian countries. On the whole, the South Asian countries during the period 2000 to 2016 had remained fastest growing region of the global economy with 7 per cent per annum growth rate. Agriculture sector has recorded 3.3 percent annual growth rate which was the lowest across sectors. The services sector growth rate was 8.7 percent, which was highest among the sectors and also of the overall growth rate. Among the South Asian countries, Afghanistan, Bhutan and India recorded 8 percent, 7.7 and 7.5 per cent respectively growth rates which were higher than the overall South Asian regions growth rate. Nepal and Pakistan were the slow growing countries in the region. Industrial sector growth rate was higher in Bangladesh, Bhutan, Maldives and Pakistan during the period under study. It can be inferred that the industrial sector has remained an engine of growth in these countries. Although industrial growth rates had remained higher than the agriculture sector growth rates except Nepal. The analysis of the table 1 clearly brings out the fact that service sector growth rates had remained usually very high but Afghanistan, India, Nepal and Sri Lanka where services sector dominated. The region as a whole has also recorded highest

growth rate in the services sector. Thus, it can be safely observed that service sector led growth has remained predominant feature in the South Asian region.

The differential growth experience across countries and sectors may have affected differently the structure of productive sectors of the countries and is presented in Table 2. The distribution of gross domestic product (GDP) across three sectors, that is, agriculture, industry and services, between the period 2000 and 2016 shows that substantial changes in the structure of the South Asian countries have occurred over time. There is a general trend of decline of the relative share of agriculture in GDP and has declined between 4 to 10 percentage point except in the case of Pakistan where it has increased 4 percentage point. It is significant to note that four countries, that is, Afghanistan, India, Nepal and Pakistan, have shown falling relative share of industrial sector in the GDP. Whereas, the relative share of industrial sector in the case of Bangladesh, Bhutan and Maldives has increased during the period 2000 to 2016. However, Sri Lanka maintained its share of industrial sector in the GDP. Except Maldives, the relative share of service sector has increased in all the countries. On the whole, the relative share of agriculture sector has declined marginally in the region, the industrial sector gained marginally (two percentage points) and the services sector gained substantially during the period of 2000 to 2016. The analysis of the table 2 clearly brings out the fact that service sector has remained the dominant sector in the process of transformation of the South Asian region.

As has been outlined by Kuznets (1966) that the changes in the production structure is followed by the changes in the workforce structure as well but with a time lag. The analysis of the changes in the workforce structure across countries and sectors show that the workforce is still highly dependent on agriculture sector for deriving their livelihood (Table 3). This is contrary to the relative share of production sector precisely because of the low capacity to absorb labour in both the industrial and services sectors. Among the South Asian countries, Afghanistan and Nepal are having 61.6 and 72.7 per cent respectively of the workforce that is engaged in the agriculture sector. However, other countries such as Bhutan, India, Pakistan and Bangladesh are also employ more than 40 per cent of their workforce in the agriculture sector. Two countries, that is, Maldives and Sri Lanka in the South Asian region are having employed workforce which is lowest but the rate of decline is also very high (Table 3). On the whole, the services sector has employed higher proportion of the workforce compared with industrial sector of the South Asian countries. This is counter intuitive when we compare it with the structural transformation experience of the now advanced countries as well as newly industrializing countries of East Asia. The contributing

factor in the case of developed countries and newly industrializing countries was the faster growth of industrial sector whereas the South Asian countries are mostly witnessing higher growth rate of the services sector.

The various indicators of competitive industrial performance (CIP) index developed by UNIDO (2015) are shown in Table 4. A comparative analysis of South Asian countries and newly industrializing countries of East Asia shows that there exists a wide gap between them. When we compare the manufacturing value added (MVA) per person for the year 2013 at 2005 prices in US dollars, South Korea has MVA $ 7180.7 whereas Nepal has only MVA $ 26.3 per person. Among the South Asian countries, Sri Lanka has highest per person MVA $ 357.2, which is very low. The East Asian countries are fast catching up with the developed countries in terms of manufacturing value added and had improved industrial competitiveness index. There ranks are very high such as South Korea, China and Malaysia. However, India has highest rank, that is, 43 among the 131 countries for which the UNIDO has provided relative ranking. Pakistan, Bangladesh and Sri Lanka are ranked as 75, 77 and 81 respectively. But Nepal is ranked 126 among the 131 sampled countries. This clearly brings out the fact that South Asian countries has to improve substantially in generating various capabilities in their respective industrial sectors. The share of manufacturing sector in the GDP is also very low in the South Asian countries compared with the East Asian countries.

As far as the innovation led high-tech and medium tech manufactured exports are concerned, the South Asian countries had recorded very low proportions compared with the East Asian countries. Among South Asian countries, India was having as high as 28.7 per cent. This share was very low for rest of the South Asian countries. The indicators of competitive industrial performance index show relatively dismal performance of the South Asian countries and sustainability of this sector is under question mark. Its low industrial base, technological backwardness and small scale of production are the factors responsible for low ranking of CIP index. Furthermore, these trends are supported by the stagnation witnessed by the manufacturing sector across South Asian countries (Table 5). The share of value added in the GDP of the South Asian countries declined from 14.3 per cent from 1980-84 to 13.5 per cent in 2010-13. The analysis of the table 5 shows that the five-year average either remained constant or has declined over the period 1980-84 to 2010-13. Contrary to this, the share of employment in the manufacturing sector has marginally gone up between the period 1980-84 and 1985-89. Thereafter, there is a steady rise of the employment shares and the share of manufacturing employment in total employment increased to 12.2 per cent during the period

2010-13. The foregoing analysis of the South Asian countries clearly brings out the fact that the industrial base, innovation and competitiveness is relatively very weak. The low per capita income and poverty is the main root cause of weak industrial sector of the South Asian countries.

4. Skill Mismatch in South Asian Countries

South Asian countries are trapped in relatively low per capita income and small industrial sectors. The average productivity of the industrial sector is also very low. The industrial sector has not been remained dynamic enough to provide the leadership role in transformation process of the South Asian countries. This kind of deceptive structural transformation process has generated mismatch between higher share of income generation of the services sector in the economy but the higher share of workforce continues to stay in the agriculture sector of the economy. This kind of mismatch in the production structure has generated mismatch in higher level of dependence of workforce and population on agriculture sector and low level of urbanization and industrial sector workforce. The consequences of this were two fold, that is, on the one hand, the skill formation of the workforce engaged in the agriculture sector is very low, which was also reflected in the low ranking of the social indicators (Dreze and Sen, 2013) and mismatch of existing skills with the existing and expected employment opportunities in the future on the other hand (UNDP, 2017). The analysis of the Table 6 shows that on an average the mean years of schooling is very low across South Asian countries. It ranges between 10.9 years in Sri Lanka and 3.1 years in Bhutan. However, India and Maldives have 6.3 and 6.2 respectively the mean years of schooling in the year 2015. When we compare it with the expected years of schooling then none of the South Asian country could able to achieve it. The adult literacy rates as reflected from the secondary school education shows that it ranges between as low as 9.6 per cent of the population of Bhutan and as high as 80.5 per cent of the population in Sri Lanka. Although the proportion of the population having completed secondary school education is increasing over a period of time, yet 48.7 per cent of the eligible children in the relevant age group could acquire education in India. Bangladesh, Pakistan, Maldives and Nepal had these proportions as 43.4, 35.4, 32.6 and 32 per cent respectively. Among the South Asian countries, two countries, that is, Afghanistan and Bhutan recorded very low adult literacy proportions of the population. In general, the human development index and accordingly the ranking of the South Asian countries is also very low. As indicated in the Table 6, the HDI rank varied from 72 for Sri Lanka to 169 for Afghanistan. Except Sri Lanka all other South

Asian countries were ranked above hundred. This gives a fairly good idea regarding low level of social development and general skill base of the South Asian countries. There are wide differences in Rural-urban skill development across South Asian countries (UNDP, 2016). The education base of the rural workforce is extremely low (Brar, 2016). The population living in the countryside of South Asian countries neither have skills to join manufacturing sector nor have enough skills to shift towards precision agriculture and agribusiness activities. Therefore, it can be inferred that the transformative skills across South Asian countries are in short supply.

The other most important mismatch that has been noticed in several studies (Ribound and Tan, 2009; EIU, 2013; and Jagannathan and Geronimo, 2013) regarding technical and vocational education and training (TVET). It has been noticed on the basis of empirical evidence that the existing technical education is inadequate both in terms of quantity and quality. The workforce trained by the educational institutions also lacks skills that are required for available jobs in the manufacturing sector. There is a lack of manpower planning and what is being produced by the educational institutions is not suitable for manufacturing employment opportunities being generated. It is also significant to note that the informal sector dominates over the formal sector in most of the South Asian countries and jobs available in the informal sector are neither remunerative nor having good working conditions and thus could not attract the workforce for such kind of jobs. But, an important fact that needs to be noted here is that in service training is the lowest among the world that is being imparted by the manufacturing firms across South Asian countries (Ribound and Tan, 2009). The mushrooming of private commercial technical educational institutions in South Asian countries have to some extent increased the supply of technical manpower but manufacturing firms provides opportunities to only those who are having ready to use skills. Thus, manufacturing firms have declared the majority of the technical manpower unfit for employment. This kind of mismatch between availability of skilled manpower and availability of jobs simply shows the lack of manpower planning in South Asian countries.

As the production system is moving towards increasingly knowledge intensive goods and services, the national innovation system is either facing stagnation or at the most declining trends (Nakandla and Malik, 2015). South Asian countries research and development (R&D) expenditure on science and technology have been remained very low and could not match with the rise of GDP. The relative share of R&D in GDP across South Asian countries has recorded wide variations but none of the South Asian countries crossed threshold level R&D, that is, one per cent R&D expenditure. It is significant to note here that the scientific and

technical manpower per million population varies across South Asian countries. But, as compared with East Asian and industrially advanced countries, it has also remained very low (UNESCO, 2015). The other pillars of national innovation system and knowledge economy is the educational expenditure as a proportion of GDP. The educational expenditure ranged between 5.89 per cent in Maldives and 1.72 per cent in Sri Lanka for the year 2012. The expenditure in higher education was as low as 0.21 per cent in Pakistan and as high as 1.21 per cent in India in the year 2012. A modest expenditure on knowledge economy and research system shows that the South Asian countries are lagging behind in the race of basic requirements of the current phase of domestic and global economy. Lack of innovations, diffusion of modern technology and inadequacy of interaction of the economic actors of production had generated a hiatus in several dimensions and intensity. This has resulted into wide gaps of income distribution and employment across and within sectors of the South Asian countries (Nayyar, 2017). Consequently, the process of development is not only turned out to be exclusionary in nature but also low productivity-low wage economic activities has limited the scope of sustained economic development to pass through the low/middle income trap (Lee, 2013). Thus, the inadequacy of scientific and technical skill base of the South Asian countries has generated a mismatch between the goals and actual reality of South Asian countries in the face of opportunities to catch up.

5. Innovation Systems, Industrialisation and Competitiveness in South Asian Countries

There has been emergence of skill mismatch required for economic transformation of the South Asian countries. The current model of economic development is driven by the market forces, where dominance of the private corporate sector is ensured by the state (Bhaduri, 2009). The education organisational structure is geared towards meeting the needs of the market economy based on individual choices. However, we have noted in the previous section that even the existing institutional arrangements could not fulfil the changing requirements of skill base desired by the private corporate sector. This mismatch has been generated between the market led model of education and productive economic activities because of the fact that neither the state nor the private corporate sector have made adequate investment in the desired direction. This is a typically case of market failure both in terms of industrialization of South Asian countries and as well as creating the adequate number and quality of skill base. Therefore, there is a dire need to develop alternative thinking for ensuring to meet the challenges and aspirations of population of South Asian countries

through appropriate industrialization and skill base suitable for the stage of economic development.

South Asian countries are expected to take a detour from the current pattern of economic transformation. To overcome the distortion in the production structure, it is imperative to integrate the production, processing and marketing of the primary sector of the South Asian countries. The derive for industrialization should begin with the integration of agriculture production with the manufacturing. Since the agriculture is largely small scale production and have hugely surplus/disguisedly employed workforce, therefore, it is useful to employ this workforce in gainful manufacturing activities. It is important to note that the employment generation in gainful economic activities has a capacity to generate higher level of domestic demand for manufacturing goods to fulfil basic needs. Another source of demand is the fast expansion of the middle class across South Asian countries during the last two decades (Krishnan and Hatekar, 2017 and Jagannathan and Geronimo, 2013). This kind of change requires entirely new skill base and organisational structure. In the era of predominance of the private corporate sector, the competition for the small scale production is relatively very tough. Therefore, it is desirable to change the organization of the production from individual to cooperative. Taiwanese experience of industrialisation, while integrating production, manufacturing and marketing activities through farmers' association/cooperatives and also directing input markets as well, is quite instructive in this respect. The local labour was employed mainly in manufacturing activities and farm activities turned out to be as part time activity. The surpluses generated were used to develop local infrastructure and expansion of economic activities. The surplus production was sold out in the international markets while participating in the global value chains and quietly created their own value chain system and also graduated from manufacturing primary production to white goods. This was possible due to the state support in terms of generating innovation system that facilitated the small producers in developing the niche markets based on short cycle technologies. The innovation system generated an environment of new opportunities and simultaneously created capabilities among the workforce so that these opportunities can be encashed upon. South Asian country governments should also adequately invest in to develop a national innovation system so that somewhat similar kind of environment can be generated to build niche market through opening up the window of opportunity through leapfrogging in technologies.

The base of such kind of alternative opportunities need a systematic public policy framework to impart relevant skills to the workforce. It is pertinent to note here that the workforce engaged in the primary sector of the South Asian countries lacks education. On the

basis of examining the historical experience of Japan's public policy making that not only succeeded in Japan but also remained the pillar of successful industrialization experience of the East Asian countries such as South Korea and Taiwan, Amartya Sen (2006) has argued that changing the face of education in Japan turned it from a backward to industrialized nation. The author further noted the public policy perception while citing from Kido Takauyoshi in the late nineteenth century that "our people are no different from the Americans or Europeans of today; it is all a matter of education or lack of education". To educate the workforce, the Japanese government had spent 43 per cent of the budget on education between 1906 and 1911. South Asian country governments should learn some lessons from public policy employed by the government of Japan and other East Asian countries for making economic transformation to succeed.

The task of economic transformation for the South Asian countries is relatively more complex and difficult due to different phase of globalization but still there exists widow of opportunity to leapfrog and thus it requires manpower planning to synchronize with the production structure. Education to the population for generating human capital is one of the fundamental pillar of the national innovation system. South Asian countries should embark on the formation of technological capabilities and learning abilities of the human workforce. The systemic approach to address deficiencies in the innovation system is required to be adopted to address the inadequacy of skill formation of the workforce and competitiveness of the industrial sector. While redrawing priorities for investment in skill formation, the South Asian countries should emphasize on individual success to collective success. The education system should impart basic education along with entrepreneurial skills to start social/collective enterprises. The environment of institutional arrangements should be created so that collective efforts should succeed and surpluses generated should be allowed to be employed both for improving the infrastructure and living conditions as well as expansion of the enterprises. This should be supported by the systems of innovation that not only fulfils the needs of necessary innovations for creating new products, brand names, marketing and organisation skills but also develops synergy between institutional arrangements and economic actors to generate a movements toward collective efforts to succeed. These skills are called transformative skills and are suitable to the cultural values of the South Asian countries. These skills can allow South Asian countries to draw advantages even in the era of 4IR. Thus, there are possible pathways that can be created if the South Asian country governments pledge to play a supportive role in build human capabilities and provide matching opportunities for the use of newly developed human capabilities. There is no other

way for South Asian countries but to industrialize for economic transformation from a low/middle income to developed economies.

6. Conclusions

This chapter has examined the skill formation, competitiveness and industrial development in systems of innovation framework. The evolutionary approached has been adopted for understanding the inadequacy of the skill formation, competitiveness and industrial development in the South Asian countries. South Asian countries are undergoing structural transformation in the era of globalization. The structure is tilted towards service orientation at an early stage of economic development. However, the most important distortion of the structural transition is the over stay of workforce in the primary sector of these economies. This is the consequence of lack of matching industrialization that could have used the surplus workforce that continue to derive their livelihood from the low paid low productive economic activities. Consequently, the major section of population still living in abject poverty. Lack of remunerative employment opportunities has created unequal distribution of income. Economic theory of growth and development has argued that there is a possibility of sustained economic growth through skill development and engaging the workforce in developing new ideas and innovations through adequate investment. In this chapter, three level of skill mismatches of the workforce of South Asian countries are identified. Firstly, the workforce engaged in the primary sector of these economies lacks basic education or have no skills that are required to transform traditional agriculture to precision agriculture and connecting it with the agribusiness. Secondly, the existing technical and general education imparted by the educational institutions do not produced workforce required to be employed in the modern industrial sector of the South Asian countries. Thirdly, the technical and scientific workforce is not only inadequate but also not producing new innovations that can provide widow of opportunity to leapfrog to the path of low productivity-low wage to high productivity high wage economic activities. An alternative strategy of industrialisation and skill formation is suggested to overcome these skill gaps/mismatches. The new skills formation that take care of cultural values of the South Asian countries, that is, social enterprises for collective efforts to succeed are suggested. Public policy of South Asian countries is required to support in investing in the human capabilities and generate an institutional arrangement that should allow the sustainability of collective enterprises. Revamping of national innovation system that integrate economic actors and bridge the gap of innovation requirements for transition from a traditional to industrially advanced economy is also suggested.

Footnotes:

1. The Fourth Industrial revolution is based on unique new technological innovations such as robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, The Internet of Things, 3D printing and autonomous vehicles.

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Table 1: Sectoral Growth Rates across Asian Countries (2000-16 at 2010 prices)

Countries	GDP	Agriculture	Industry	Man.	Services
Afghanistan	8	2.9	7.5	3.2	10.4
Bangladesh	6	4.3	8.2	8.5	5.8
Bhutan	7.7	2	9.2	8.9	8.5
India	7.5	3.3	7.6	8.3	9.6
Maldives	6.3	0.5	6.7	1.7	6.3
Nepal	4.1	3.2	2.7	1.6	4.8
Pakistan	4.2	2.9	4.9	5.6	4.8
Sri Lanka	6	3.8	6.2	4.3	6.5
South Korea	7	3.3	7.4	7.9	8.7

Source: World Bank (2016)

Table 2: Sectoral Shares of GDP across Asian Countries

Countries	Agriculture % of GDP		Industry change		Services	
	2000	2016	2000	2016	2000	2016
Afghanistan	32	22.10	27	23.4	41	55
Bangladesh	20	15	25	29	56	56
Bhutan	23	16	37	42	40	41
India	20	17	34	29	47	54
Maldives	8	3	15	24	77	73
Nepal	36	33	18	15	46	52
Pakistan	21	25	27	19	51	56
Sri Lanka	12	8	30	30	58	62
South Korea	20	18	32	34	47	58

Source: World Bank (2016)

Table 3: Workforce Structure across South Asian Countries

Countries	Agriculture		Industry		Services	
	2000	2016	2000	2016	2000	2016
Afghanistan	69.4	61.6	11	10.0	19.6	28.5
Bangladesh	59.5	41.7	9.9	18.9	38.0	39.4
Bhutan	54.2	57.4	16.2	4.7	29.6	32.8
India	59.9	45.1	16.0	24.3	24.1	30.6
Maldives	14.4	7.9	20.0	22.9	65.6	69.2
Nepal	73.0	72.7	11.2	10.9	15.8	16.4
Pakistan	48.1	42.8	18.0	19.7	33.9	36.9
Sri Lanka	43.2	27.8	20.4	26.1	36.4	46.1
South Korea	58.0	44.2	15.9	23.2	26.1	32.7

Source: ILO (2016)

Table 4: Indicators of Industrial Competitiveness across South Asian Countries

Country	**MVA Per Capita 2005 $ 2013**	**Industrial Competitiveness Index 2013**	**Share of MVA in GDP (%) 2013**	**Medium & high-tech exports as % of total exports 2013**
India	161.7	43	14	28.7
Nepal	26.3	128	6	20.3
Pakistan	139.1	75	17	10.4
Sri Lanka	357.2	81	19	8.2
Bangladesh	118.28	77	19	2.0
China	1142.6	5	33	58.3
South Korea	7180.7	3	29	72
Malaysia	1717.0	24	25	58.4

Source: UNIDO (2015)

Table 5: Share of Manufacturing Value Added and Employment of South Asian Countries

Year	**MVA as % of GDP in South Asia**	**Share of Manufacturing Employment in total employment**
1980-84	14.3	9.6
1985-89	14.3	10.1
1990-94	14.2	10.3
1995-99	14.5	11.4
2000-04	13.9	12.1
2005-09	14.8	11.9
2010-13	13.5	12.2

Source: UNIDO (2015).

Table 6: Social Indicators across South Asian Countries

Countries	HDI	Life expectancy in years	Expected mean years of schooling	Mean years of schooling	% Population with at least secondary education
Afghanistan	0.479 (169)	60.7	10.1	3.6	22.2
Bangladesh	0.579 (140)	72	10.2	5.2	43.1
Bhutan	0.607 (132)	69.9	12.5	3.1	9.6
India	0.624 (131)	68.3	11.7	6.3	48.7
Maldives	0.701 (105)	77	12.7	6.2	32.6
Nepal	0.568 (144)	70.0	12.2	4.1	32.0
Pakistan	0.550 (148)	66.4	8.1	5.1	35.4
Sri Lanka	0.766 (72)	75	14	10.9	80.5

Source: UNDP (2016)