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Reading time: 13 minutes

Fighting Automation through Education

Are workers in high-risk occupations educating themselves?

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Introduction

Digitalization and sustainability are two of the most powerful influences in today's life. Each has spawned a massive amount of research about how it will change business and society. The intersection of these trends, however, remains largely unexplored territory. The Sustainable Development Goals (SDGs) of the United Nations were drafted at a time when the huge positive and negative effects of digitalization were not yet obvious. Digitalization brings challenges and opportunities for the successful implementation of the SDGs, especially for developing countries. An important prerequisite for the achievement of the SDGs is an inclusive labor market. This is not just important to achieve all targets in SDG 8 "Decent Work and Economic Growth," but also to fight poverty (SDG 1), hunger (SDG 2), inequality (SDG 10) and many more.[1] As the International Labour Organization states: "SDG 8 lies at the heart of the 2030 Agenda: it straddles the economic, social and environmental dimensions of sustainable development and is therefore inextricably linked to many other goals."[2]

Due to the ongoing and disruptive process of automation, connectivity and the knowledge explosion in the digital age leading to Industry 4.0, the way we work will change dramatically. Routine jobs are especially at great risk of being automated. At the same time, developing countries rely on cheap labor as an important factor for economic growth as is the case in Cambodia. But technology is not just a potential threat for these jobs, it can also help to create new jobs that are more inclusive and better paid. To use this potential, workers need to permanently upgrade their skills. This leads us to the question: Are workers in occupations with a high-risk of being automated aware of the situation and therefore motivated to upgrade their skills?

To get an answer, we first looked into how automation affects high-risk occupations in general. Second, we assessed the status-quo of the Cambodian labor market to identify the scale of jobs at risk of being automated. In several focus groups, we asked workers in those occupations if they are aware of their future job prospects and therefore educating themselves. Finally, we chose the governance perspective to provide policy recommendations that limit the risks and utilize the chances of digitalization for the inclusiveness and productivity of the Cambodian labor market.

The Effects of Automation for High-Risk Occupations

The global discussion on the transformation toward sustainability, up to now, has hardly taken into account the fundamental dynamics of digitalization, e.g. the opportunities and risks of artificial intelligence, new technologies, data economies or the interlinkage between our physical world and virtual spaces. These topics cannot be found in the 2030 Agenda adopted by the UN in 2015.[3] At the same time analyses show that digitalization has a massive impact on all 17 SDGs. The debate on the implementation of the SDGs can no longer be conducted without an adequate understanding of the potential risks and opportunities of digitalization

1. Take Action for the Sustainable Development Goals, The United Nations, Sustainable Development Goals, 2020.https://www.un.org/sustainabledevelopment/sustainable-development-goals/

2. Time to Act for SDG 8: Integrating Decent Work, Sustained Growth and Environmental Integrity – International Labour Office – Geneva: ILO, 2019.

3. WBGU – German Advisory Council on Global Change (2019): Towards our Common Digital Future. Summary. Berlin: WBGU.

for the entire 2030 Agenda.[4] For this case, it means assessing what effects the digital transformation has for low-skilled workers in developing countries and in particular what effects automation has for high-risk occupations.

In general, there are risks and opportunities in the digital transformation for the labor markets in developing countries. However, it should be noted in this context that sufficient education and qualification in handling new digital technologies are essential prerequisites for all development opportunities. Against this background, the positive effects have been seen as rather small – especially when the education level is low.[5]

Risks will appear for the labor markets as digitalization is radically transforming them. People will continue to work in the future, but it remains to be seen how this can be embedded into society and organized in a way that the functions of gainful employment as we know them today – securing livelihoods, social participation, the basis of personal self-esteem — can be guaranteed.[6] In addition, increasingly 'intelligent' machines can be used to replace human labor in more and more areas. Although it is as yet unclear how far this substitution of labor by machines will extend and whether the loss of employment will be compensated by new activities and forms of work, this development is associated, at least in a transitional phase, with manifold distributional implications at various levels. The boundaries between adopters and non-adopters run between the 'classical' production factors of labor and capital, between workers with different qualifications, but also between groups with different opportunities to use data and digital technologies.[7]

The biggest challenge for inclusive work is the "disruption of labor markets by the comprehensive automation and the danger that human labor will become increasingly irrelevant to the economy".[8] Especially workers in routine-based occupations are at risk of being replaced by automated processes. Many service jobs like driving a taxi or working in a fast-food restaurant could simply disappear.[9] These rationalization effects of innovations (e.g. substitution of human labor with machines) threaten to decouple economic growth from employment, jeopardizing social cohesion and political stability.[10] That means that automation in business will enable companies to do more with fewer workers, driving down wages, constraining the growth of (median) household income and exacerbating an already alarming income inequality.[11]

Automation is most simply defined as "the technology by which a process or procedure is performed with minimal human assistance".[12] Robots and machines are no longer just repeating a work step millions of times.

4. WBGU – German Advisory Council on Global Change (2019): Towards our Common Digital Future. Summary. Berlin: WBGU.

5. WBGU – German Advisory Council on Global Change (2019): Towards Our Common Digital Future. Flagship Report. Berlin: WBGU.

6. WBGU – German Advisory Council on Global Change (2019): Towards our Common Digital Future. Summary. Berlin: WBGU.

7. WBGU – German Advisory Council on Global Change (2019): Towards Our Common Digital Future. Flagship Report. Berlin: WBGU.

8. Digital Momentum for the UN Sustainability Agenda in the 21st Century, Policy Paper No. 10, German Advisory Council on Global Change, June 2019.

9. Harnessing the Digital Revolution, UNDP, 2018, accessed at https://feature.undp.org/global-goals-technology/

10. Digital Momentum for the UN Sustainability Agenda in the 21st Century, Policy Paper No. 10, German Advisory Council on Global Change, June 2019.

11. David Kiron and Gregory Unruh, The Convergence of Digitalization and Sustainability, MIT Sloan Management Review, January 2018. https://sloanreview.mit.edu/article/the-convergence-of-digitalization-and-sustainability/?gclid=Cj0KCQjw9ZzzBRCKARIsANwXaeKkGfC9dnPr5KSWxMSxFtDujEjy3Oj0awD7CHGUHBB26vT53nIEqEIaAn1DEALw_wcB

12. Groover, Mikell (2014). Fundamentals of Modern Manufacturing: Materials, Processes, and Systems.

Networked production processes decide with minimal human intervention as how each component should be used.[13] The future factory can thus produce customer-tailored pieces because it decides by itself which component it manufactures in conjunction with other machines. The factory of the future can react flexibly and quickly to customer needs through big data concepts. Through increased efficiency, goods are produced according to real time needs. After all, no human could reschedule so quickly, process information on such a scale from diverse data streams and make the most efficient and effective business decisions.[14] An advanced form of automation is **computerization.**[15] Osborne and Frey refer to computerization as job automation by means of computer-controlled equipment.[16]

Automation changes the overall relationship between industrial employment and labor costs because it occurs faster in countries with high labor costs, assuming the incentive to reduce labor costs trumps other factors such as the location.[17] The current trend toward labor market polarization accelerates with computerized automation risking principally low-skill and low-wage occupations. As tech-nology races ahead, low-skill workers will reallocate to tasks that are non-susceptible to computerization – i.e., tasks requiring creative and social intelligence. For workers to win the race, however, they will have to acquire these skills in the first place.[18]

When and to which scale automation has an impact on labor markets remains unclear. In an ILO survey, decision makers in the garment industry did not believe automation technologies will lead to sizable job losses in the industry in the near future, and suggest a likely outcome is greater worker-machine collaboration. Nevertheless, increases in productivity due to automation could reduce the industry's job generation potential. Workforce implications in the medium to long-term are, therefore, unclear. They argue that assessments on potential worker displacement based exclusively on the task composition of occupations overstate risk in light of practical issues faced at the shop floor – with the caveat that it is difficult to anticipate technological developments and their employment implications beyond the near future.[19]

The ongoing digital structural transformation in the international division of labor will lead to a readjustment of the role of developing countries and emerging economies. Unequivocal conclusions on the impact of digitalization on the international organization of value chains are currently limited. On the one hand, there are potentially substantial job losses due to digitally supported automation and production relocation processes; on the other hand, new markets are accessible, primarily via digital platforms.[20] A programmer or graphic designer can be e.g. based in India and working for a US company. Both can find each other via digital platforms. It seems that

13. Jann Ravling, Was ist Industrie 4.0? Die Definition von Digitalisierung, September 4, 2018, https://www.wfb-bremen.de/de/page/stories/digitalisierung-industrie40/was-ist-industrie-40-eine-kurze-erklaerung.

14. Ibid.

15. The Oxford Companion to United States History, Edited by Paul S. Boyer.

16. Carl Benedikt Frey, Michael A. Osborne, The Future of Employment: How Susceptible Are Jobs To Computerisation? September 17, 2013.

17. World Bank. 2019. World Development Report 2019: The Changing Nature of Work. Washington, DC: World Bank.

18. Carl Benedikt Frey, Michael A. Osborne, The Future of Employment: How Susceptible Are Jobs To Computerisation? September 17, 2013.

19. Fernanda Bárcia de Mattos, Jeff Eisenbraun, David Kucera & Arianna Rossi, International Labour Organization, Automation, employment and reshoring in the apparel industry: Long-term disruption or a storm in a teacup? May 2020.

20. WBGU – German Advisory Council on Global Change (2019): Towards our Common Digital Future. Summary. Berlin: WBGU.

the potential offered by new forms of market access and employment opportunities lags behind the societal challenges posed by automation and new forms of work, especially in developing countries and emerging economies.[21] Digital technologies could fuel consumption; hardening the digital divide; creating dislocation in the labor markets; and consolidating the power of the few over the many.[22] In many developing countries, the availability and the price of energy is a prerequisite for the introduction of advanced technologies and industrialization. In the manufacturing sector e.g. investments in advanced production technology are rarely done when the energy costs are too high. Additionally, sourcing decisions for the big textile brands are now also based on clean energy. Nevertheless, new technologies have not yet been widely adopted in developing countries, owing, among other reasons, to a lack of progress in establishing the necessary large-scale energy infrastructure.[23]

By reducing the costs of communication and information access, digitalization also opens up opportunities for developing countries to develop their economies independently. Companies and employees can also gain easier access to international markets when barriers to markets are falling. For instance, digital technologies can reduce the amount of capital needed to participate in international (digital) markets. In principle, for example, cloud computing also offers smaller companies in developing countries access to the latest technologies without having to fully bear the high investment costs and risks of server infrastructures. At the same time, with the help of digitalization (service) activities can be outsourced and traded internationally. New pricing models and low first-copy costs lead to less capital-intensive business models. Digital work platforms represent a new, global labor market for such jobs, to which developing countries and emerging economies have direct access. Digital work platforms can lead to a new quality in the international division of labor.[24]

The increasing demand for medium and highly skilled labor compared to the falling demand for less-skilled labor generally harbors the risk of rising inequality and growing social tensions. This also applies to developing countries and emerging economies. In developing countries, however, these developments become even more explosive as a result of greater political instability, the often weaker (state) institutions, and the frequently lacking or considerably weaker social-security systems. Automation can also lead to lower demand for migrant workers in industrialized countries. The consequence would be a collapse in return remittances, which in many developing countries and emerging economies account for a significant proportion of the GDP.[25] Also, new forms of work (e.g. quasi-self-employment) in the digital economy undermine standards in occupational health and safety, and increase the risks of worker exploitation and control.[26] Estimates show that up to two-thirds of all jobs in developing countries could be at risk.[27]

21. WGBU – German Advisory Council on Global Change (2019): Transforming our World in the Digital Age. Berlin. WBGU. https://www.wbgu.de/fileadmin/user_upload/wbgu/publikationen/factsheets/flt_2019/WBGU_2019__SustainableDigitalAge_EN.pdf

22. Digital with Purpose: Delivering a SMARTer2030, Global Enabling Sustainability Initiative (GeSI), 2019.

23. Time to Act for SDG 8: Integrating Decent Work, Sustained Growth and Environmental Integrity – International Labour Office – Geneva: ILO, 2019.

24. WBGU – German Advisory Council on Global Change (2019): Towards Our Common Digital Future. Flagship Report. Berlin: WBGU.

25. Ibid.

26. Digital Momentum for the UN Sustainability Agenda in the 21st Century, Policy Paper No. 10, German Advisory Council on Global Change, June 2019.

27. Harnessing the Digital Revolution, UNDP, 2018, accessed at https://feature.undp.org/global-goals-technology/

This will lead to a situation in which digital technologies can become a threat to the implementation of the SDGs and inclusive work. The International Labour Organization (ILO) which is the custodian agency for 14 SDG indicators related to the labor market acknowledges that at the current pace, decent work for all will not be achieved by 2030. The progress in labor markets around the world has been too slow and uneven to ensure a sustainable future with decent work opportunities for everyone.[28]

Some groups will be especially affected by these developments. For example, women, young workers, disabled workers or low-skill-workers. As already mentioned, this study focuses on occupations at high-risk of being automated, as they are vulnerable and have, at least theoretically, the potential to upgrade their skills. Empirical findings point out that the higher the wages and the higher the education level, the lower the probability of jobs being automated.[29] Education is the key for inclusiveness. That means that on the supply side high-quality, future-oriented and affordable education has to be offered by state institutions and the private sector. Equally important is the awareness for future job prospects and the motivation by workers to educate themselves – the demand side. There is not much research yet that focuses on these factors. There is even less research for developing countries and the obstacles workers in routine tasks face personally and institutionally. Research in developed countries shows so far that low-skilled workers participate less often in training than highly-skilled workers, because of the lack of private returns to such investments and lack of the intrinsic motivation to participate in training.[30] Other studies argue that workers in high-risk occupations are active and motivated; however, their motivational orientation may not be toward what is considered productive activities.[31] Even if motivation is one of the most commonly interpreted and diversely defined constructs in psychology, as too many factors affect motivation, this study still shows that the personality and mindset of the learner plays a crucial role for education.

The Cambodian Labor Market and its High-Risk Occupations

After discussing the challenges of automation for high-risk occupations in general, this chapter focuses on how automation affects the Cambodian labor market. Cambodia is an emerging economy with a growing manufacturing sector, which is predominantly driven by the garment industry (textiles, clothing and footwear) and low wages in the sector.[32] Due to steady economic growth and macroeconomic stability, the GDP per capita more than tripled since 2005. In 2017, Cambodia is a lower-middle-income country with a GDP per capita of 1,384.4 USD. At the moment, there is a continuous economic growth of approx. 7.0 percent annually.[33] The manufacturing sector, which contributed 33 percent of the GDP in 2017 is dominated by textile and leather. 800,000 employees generate approx. 75 percent of all export

28. ILO, Can we achieve decent work for all by 2030? https://ilostat.ilo.org/2020/02/21/can-we-achieve-decent-work-for-all-by-2030/

29. Carl Benedikt Frey, Michael A. Osborne, The Future of Employment: How Susceptible Are Jobs To Computerisation? September 17, 2013.

30. Training motivation of low-skilled workers, Didier Fouarge*, Trudie Schils** & Andries de Grip*, 7 JULY 2009.

31. 'In reality, i motivate myself!'. 'Low-skilled' workers' motivation: between individual and societal narratives, Kristina Mariager-Anderson, Pia Cort and Rie Thomsen, BRITISH JOURNAL OF GUIDANCE & COUNSELLING, 2016.

32. ASEAN in Transformation, How Technology is Changing Jobs and Enterprises, Cambodia Country Brief, https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_579672.pdf, April 2017.

33. World Bank, Data, https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=KH&name_desc=true, Accessed June 18, 2019.

earnings. The garment sector indirectly contributes to employment in retail, trade and transportation. The exports are totaling 8 billion USD in 2017. This strong focus on garment carries a big future risk as vulnerable groups heavily depend on it.[34]

Cambodia consistently had one of the lowest unemployment rates for the past 30 years according to official statistics from the World Bank: the latest figures put it at the 5th lowest. Cambodia's official unemployment rate has been between a low of 0.39 percent (2015) and a high of 1.35 percent (2005) since 1991, most recently in 2019, it stands at 0.68 percent.[35] The definition of the unemployment rate is "those individuals without work, seeking work in a recent past period, and currently available for work, including people who have lost their jobs or who have voluntarily left work."[36] Considered within the ILO's and the Cambodian government's definition of those employed are those "engaged in any activity to produce goods or provide services for pay or profit", which includes those "who worked in a job for at least one hour" and who receive remuneration payable "indirectly to a household or family member."[37] Those who are own-account workers or contributing family workers, although counted as employed, are not particularly safe in their employment. The ILO and World Bank acknowledge the pitfalls of this methodology: "Paradoxically, low unemployment rates can disguise substantial poverty in a country, while high unemployment rates can occur in countries with a high level of economic development and low rates of poverty. In countries without unemployment or welfare benefits, people eke out a living in vulnerable employment."[38]

The ILO, which calculates unemployment, suggests that for Cambodia a more accurate indicator for the health of the labor market is to count those in "vulnerable employment." Vulnerable employment is defined as the sum of the employment status groups of own-account workers and contributing family workers.[39] Although it has fallen sharply in recent years, as of 2019, approximately 50 percent of Cambodia's population is still considered to be in vulnerable employment. When assessing Cambodia's working population status through this lens instead of unemployment, it becomes clear that Cambodia has labor market issues which need to be addressed as own-account and contributing family workers are more likely to experience low job and income security than employees and employers as well as lower coverage by social protection systems and employment regulation.[40]

34. Jochen Saleth, Zur wirtschaftlichen Lage in Kambodscha, März 2019.

35. World Bank Unemployment Rate Data accessed at www.macrotrends.net. Retrieved 25 September, 2020.

36. World Bank: world development indicators Metadata Glossary; accessed at https://databank.worldbank.org/metadataglossary/world-development-indicators/series/SL.UEM.TOTL.NE.ZS

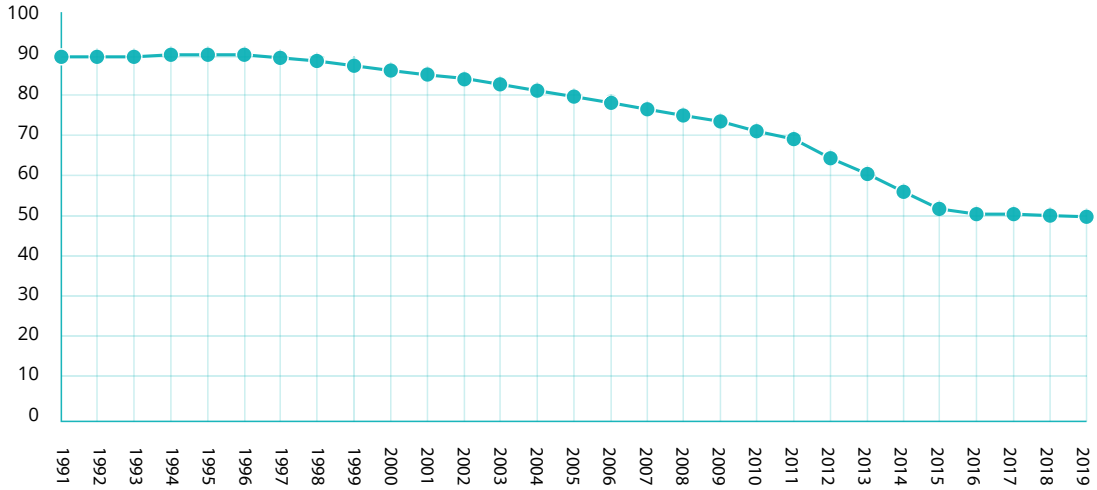
37. ILO: Resolution concerning statistics of work, employment and labour underutilization (pg. 6); accessed at http://www.ilo.ch/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf

38. World Bank: world development indicators Metadata Glossary; accessed at https://databank.worldbank.org/metadataglossary/world-development-indicators/series/SL.UEM.TOTL.NE.ZS

39. ILO: Employment by status in employment; accessed at http://www.ilo.org/global/about-the-ilo/newsroom/features/WCMS_120470/lang--en/index.htm

40. World Bank: world development indicators Metadata Glossary; accessed at https://databank.worldbank.org/metadataglossary/world-development-indicators/series/SL.UEM.TOTL.NE.ZS

Graph 1: *Percentage of Cambodia's population working in vulnerable employment*



Source: *World Bank (2020)*

According to the ILO, 88 percent of jobs in the garment sector are at high risk of being automated. This could impact almost half a million sewing machine operators who primarily perform repetitive and manual tasks.[41] The ILO estimated that 57 percent of all Cambodian workers (or over 4 million jobs) face a high risk of automation.[42] It is likely that specific segments of workers will significantly feel the impact including women, young workers and primary school graduates. Cambodian women are 50 percent more likely to be employed in an occupation at high risk of automation compared to men.[43] Young Cambodian workers aged 15 to 24 are 10 percent more likely to have an occupation at high risk relative to adult Cambodian workers. Moreover, primary school graduates are 20 percent more likely to be in a high-risk occupation than post-secondary graduates. Workers with lower education levels tend to perform manual and repetitive tasks that are automatable in nature.[44]

Critically, one in five Cambodian enterprises blames the lack of skilled workers who can operate required technologies as the second largest barrier.[45] This highlights significant skill gaps in Cambodia resulting from low education levels among the Cambodian workforce. Enterprises in Cambodia also reported that technology does not have to be upgraded.[46] This could relate to the fact that wage levels in Cambodia are relatively low compared to other countries in the region, and technology is perceived as expensive.

41. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016.

42. Ibid.

43. ASEAN in Transformation, How Technology is Changing Jobs and Enterprises, Cambodia Country Brief, https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_579672.pdf, April 2017.

44. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016.

45. Ibid.

46. Ibid.

These findings could change in the near future as technology costs decline while labor costs increase.[47]

Cambodia's labor productivity in the garment sector is among the lowest in ASEAN and represents only 22 percent of the level in Thailand's garment sector.[48] Garment production in Cambodia will be impacted by technology uptake both inside and outside Cambodia. Inside Cambodia, enterprises are automating labor-intensive production processes to raise productivity. Increased automation will impact more than 650,000 Cambodian workers whose jobs would be at high risk of automation. The majority of these workers will be young women with low education. In terms of skill requirements, growing automation will increase the demand for technicians and high-skilled workers who can operate new machinery.

The economic success of Cambodia in previous years was possible through low wages for low skilled workers but this is unlikely to be a successful model any longer as wages rise. To be economically successful in the future, Cambodia will have to overcome its reliance on low-cost labor. It needs to invest more in skills to compete in higher value-added sectors to attract foreign investment. Limited educational opportunities are provided by the state and companies are reluctant to invest in the skillset of their workers. Almost every company expresses a concern that their staff will leave the company after receiving training which keeps companies from investing into the education of their staff.[49]

Obstacles to industrial development must be overcome. Currently, Cambodia runs short of home-grown technology, lacks research and innovations, and has high energy costs.[50] Cambodia needs to consider the future of specific sectors and activities: Who would be the main winners and losers of the digital transformation? Which skills are needed in the future and how can they be developed to prepare for a digital economy and especially: How can the poorest benefit from digitalization? Interviews with manufacturing firms suggest there is still little awareness of the changes that may come sooner rather than later.[51]

Digitalization is a threat to the inclusive labor market, but it is also a possibility, as technologies can provide vulnerable groups new employment opportunities and an easier way to upgrade their skill levels. Enhancing the positive impact needs to go hand in hand with minimizing the negative impacts.[52] "Digital technologies can trigger productivity and growth. With the right framework conditions, higher productivity and automation can, in turn, help the spread of decent work environments and create space for new models of sustainable work."[53] It will be crucial to develop the skill levels needed to navigate the knowledge economy, to create their own opportunities and design their own solutions. Investments in skills that cannot be automated are crucial: creative thinking, social intelligence,

47. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016.

48. Ibid.

49. Pheakdey Heng, Preparing Cambodia's Workforce.

50. ASEAN in transformation : perspectives of enterprises and students on future work / International Labour Office, Bureau for Employers' Activities (ACT/EMP). - Geneva: ILO, 2016 (Bureau for Employers' Activities (ACT/EMP) working paper ; No. 11)

51. Dirk Willem te Velde, Economic Transformation In Cambodia | Prospects, Challenges And Avenues For Further Analysis, ODI-CDRI, Background Note, April 2019.

52. Digital with Purpose: Delivering a SMARTer2030, Global Enabling Sustainability Initiative (GeSI), 2019.

53. Digital Momentum for the UN Sustainability Agenda in the 21st Century, Policy Paper No. 10, German Advisory Council on Global Change, June 2019.

creativity and transformative leadership.[54] If successful, new labor markets, goods and services (e.g. financial services, education) are created, which expand opportunities for economic inclusion, particularly in developing countries and emerging economies."[55]

When it comes to a more concrete question, which occupations will disappear in Cambodia, there is limited reliable data available. The International Labour Organization made a risk analysis in 2016 based on the methodology by Osborne and Frey.[56] "Frey and Osborne contend that nearly every occupation can be computerized in the next couple of decades, with the exception of those that involve high amounts of three broadly defined activities – creative intelligence, social intelligence, and perception and manipulation – that currently present automation bottlenecks. Frey and Osborne codify the probability of an occupation's automation in terms of the extent to which they require these three non-automatable tasks."[57] The ILO identified certain high-risk occupations for Cambodia. "Lastly, the methodology does not attempt to predict the precise number of jobs that will be automated or displaced, nor does it identify an exact year when this will happen."[58]

***Table 1:** High-risk occupations in Cambodia*

High-risk Occupations	Employment (000)	Risk of Automation (%)
1. Stall and market salespersons	999.0	94.0
2. Crop farm laborers	616.2	87.0
3. Sewing machine operators	446.9	89.0
4. Livestock and dairy producers	263.2	76.0
5. Building construction laborers	242.7	80.0
6. Bakers, pastry-cooks and confectionery makers	92.4	89.0
7. Street food salesperson	89.8	90.0
8. Bricklayers and related workers	78.6	82.0
9. Forestry and related workers	69.6	79.2
10. Tailors, dressmakers, furriers and hatters	68.0	84.0

***Source:** International Labour Organization (2016)*

54. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016, p. 8.

55. Digital Momentum for the UN Sustainability Agenda in the 21st Century, Policy Paper No. 10, German Advisory Council on Global Change, June 2019.

56. Carl Benedikt Frey, Michael A. Osborne, The Future of Employment: How Susceptible Are Jobs To Computerisation? September 17, 2013.

57. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016, p. 8.

58. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016, p. 10.

Studies on the development of workers' skills in Cambodia thus far are either outdated, small in scope, or focus on different perspectives. In the 'ILO ASEAN in transformation' student survey from 2015, 102 students from Cambodia were questioned.[59] Which means that in the fast-changing Cambodian Labor market the data is comparably old and focused on high education as 95,9 percent of Cambodian participants are coming from top-tier-universities.[60] It excludes the vast majority of students from public and low-cost Cambodian universities and those who are not in formal education systems. In Cambodia, merely one in ten workers completed secondary schooling or some post-secondary education.[61] Newer but also limited is the survey by Heng on digital skills in Cambodia. In a mixed methodology, 100 employees were interviewed.[62]

Ouch Chandarany used a randomized experiment to provide evidence on the effects of vocational training programs for economically disadvantaged young adults in Cambodia. Individuals aged between 15 and 30 were randomly offered a two-month full-time training course in housekeeping for the hospitality sector. The program has positive but statistically insignificant effects on employment outcomes. The program led to many dropouts, their participation was mainly constrained by family obligations, lack of transport to the training center and temporary job opportunities. It became clear that they need other support in addition to training. Job-readiness training, job placement assistance, career guidance and counselling is needed to help economically disadvantaged young adults break into the labor market.[63] All studies conducted so far in Cambodia on future skills did focus on skill levels and skills that might be needed, but no research has been done so far on the motivation and awareness of workers to upgrade their skill level.

To conclude, there are a number of low-skilled jobs at risk in Cambodia. There is an urgency to upgrade the skills of these workers. Education, in general, is influenced by many different aspects; institutions like schools or universities, curricula, teacher-student relations, the income of families and many more. When it comes to lifelong learning or learning on the job the motivation and awareness of the learner is a crucial and often underrated aspect. Therefore, we bring those workers in high-risk occupations, their awareness of the problem, their motivation to educate themselves and the obstacles they face into focus. This leads to the main question:

Are workers in occupations with a high-risk of being automated aware of the situation and therefore upgrading their skills?

Methodology and Data Collection

As there is no research on awareness and motivation in Cambodia so far, we decided on an explorative approach to answer the question. This gives room to gain a better understanding of the situation and puts the workers and their

59. Jae-Hee Chang and Phu Huynh, ASEAN in transformation : the future of jobs at risk of automation, International Labour Office, Geneva 2016, p. 10.

60. ASEAN in transformation : perspectives of enterprises and students on future work / International Labour Office, Bureau for Employers' Activities (ACT/EMP). - Geneva: ILO, 2016 (Bureau for Employers' Activities (ACT/EMP) working paper ; No. 11)

61. ASEAN in transformation : the future of jobs at risk of automation / Jae-Hee Chang and Phu Huynh ; International Labour Office, Bureau for Employers' Activities ; ILO Regional Office for Asia and the Pacific. - Geneva: ILO, 2016 (Bureau for Employers' Activities (ACT/EMP) working paper ; No. 9)

62. Pheakdey Heng, Preparing Cambodia's Workforce.

63. Ouch Chandarany Vocational Training and Labour Market Transitions: A Randomised Experiment Among Cambodian Disadvantaged Young Adults, in: Vathana Roth, ed. 2019. Job Prospects for Youth, Low-skilled and Women Workers in the Greater Mekong Subregion. Phnom Penh: Cambodia Development Resource Institute.

perception at the center. Using focus group discussions one can analyze the workers' feelings and perceptions toward their occupation and future employability. The focus groups allow in-depth conversations with a mixture of different workers. Using focus groups, assumptions can be tested, conversations can flow, and new ideas and questions can be posted on the fly. In particular, the focus groups were useful in proposing new hypotheses. Respondents for the groups were selected based on particular requirements. In this case, they were selected by their occupation being at risk of automation (the same 10 occupations identified by the ILO), their age, gender and location.

In total, six groups were undertaken, each group had six respondents within it, six being the ideal number for a focus group, considered large enough to allow a breadth of opinions and for diverse ideas to flow whilst also not being too large to be unwieldy. A foremost book on conducting focus groups explains that groups of four to six participants are ideal "if the study is to gain understanding of people's experiences, the researcher typically wants more in-depth insights. This is usually best accomplished with smaller groups. Also, smaller groups are preferable when the participants have a great deal to share about the topic or have had intense or lengthy experiences with the topic under discussion."[64]

Each focus group session lasted around two hours and was recorded in Khmer and English. The focus group discussions were conducted by Spear Insights, a market research and analytics company based in Phnom Penh.

Based on the aforementioned literature the following objectives structured the conversation in the focus groups:

- Understanding the factors which make someone choose a job at risk of automation
- Understanding workers' knowledge of job automation
- Understanding workers' perception of their own possible jobs at risk
- Understanding workers' attitudes toward education and upskilling to achieve job security
- Create hypotheses for changing worker attitudes toward upskilling

Respondent Criteria

These groups were divided up most critically by gender and location. For time and cost efficiency the sample was undertaken around Cambodia's capital city of Phnom Penh. As some of the high-risk occupations are more rurally focused, the groups were split between respondents who live in the urban part of the

64. Focus Groups: A Practical Guide for Applied Research. Accessed at https://www.corwin.com/sites/default/files/upm-binaries/24056_Chapter4.pdf

city and those who live in the outskirts of the city or the surrounding province of Kandal.

For both locations, the groups were split with a male-only, female-only and a male/female split group, totaling 6 groups overall.

***Table 2:** Organization of the groups*

Group	Gender	Location
1	Male/Female split	Urban
2	Male	Urban
3	Female	Urban
4	Male Female split	Semi-urban/rural
5	Male	Semi-urban/rural
6	Female	Semi-urban/rural

Within each group, the respondents were divided so that two were within the age group of 20-24, two between 25-29 and two between the ages of 30-35. The age range of 20-35 was chosen under the impression that the people within this range would have a few years of work experience, but would not be too old to consider gaining further training or education. In Cambodia, more than 50 percent of those who aged over 15 years old have already entered the workforce.[65] It can be assumed that those who are younger are more likely to consider gaining further education or skills and thus these respondents would have higher potential than older demographics. Furthermore, with the average age of marriage in Cambodia being 20.5 for women and 23.0 for men and the average age of first childbirth among women is 22.4,[66] these respondents would create a cross-section of those who are single, thinking about having families or already having their own offspring

Recruitment Methods

Before recruitment began, a screening questionnaire was created in English and then translated into the local Khmer language. The questionnaire set out the specific criteria that must be met for a respondent to join one of the focus groups. Once briefed, the recruitment staff set out to find respondents. The recruitment was undertaken with a mixture of random and purposive sampling. In addition to the specific criteria of the groups, maximum quotas were set for each district of Phnom Penh and for each occupation to ensure that there was a good mixture of responses within the groups. Furthermore, additional criteria needed to be met for a respondent to join the groups, such as not knowing any of the other respondents, being open and friendly to talk.

Focus Group Specifics

All six focus groups were undertaken at the Konrad-Adenauer-Stiftung (KAS) head office in Phnom Penh. To achieve the research objectives set out earlier in the report, a structured discussion guide was created. Each group followed the same discussion guide. However, based on the findings as the research continued and due to the individual responses within each group, the flow and probing questions asked varied slightly between groups. The discussion guide was created so that each group discussion would last two hours in length. The full discussion guide is contained within the annex of this report.

65. Cambodia Labour Force and Child Labour Survey 2012. Accessed at http://www.oit.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_230721.pdf

66. National Institute of Statistics, Directorate General for Health and ICF International. 2015. 2014 Cambodia, Demographic and Health Survey Key Findings. Rockville, Maryland, USA: National Institute of Statistics, Directorate, General for Health and ICF International. Accessed at https://dhsprogram.com/pubs/pdf/SR226/SR226.pdf

Respondent Demographics

In total, 51 respondents arrived at the venue to partake in the groups, 36 of these respondents were selected to take part in the discussions. The 36 selected were chosen based on their profiles to get the best mix of final respondents taking part. The additional 15 respondents were thanked for their time and sent home. A full table of respondent demographics can be found in the appendix of this report.

Overall, 39 percent of the respondents were single compared to 61 percent who were married. The respondents were split exactly 50 percent with children and 50 percent without. From each of the 10 high risk occupations, there were between 2-6 respondents who attended the groups, except 'forestry and related workers' due to the focus groups taking place in and around Phnom Penh where there is no forestry work to be had.

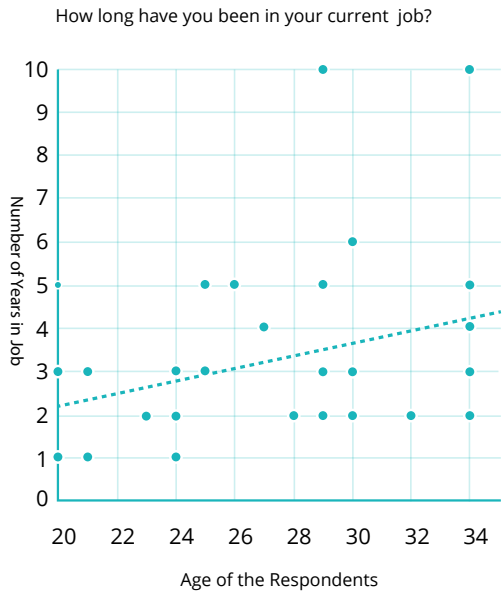
In total, 17 percent of respondents had only primary education, 42 percent had secondary education, 39 percent for high school education and 3 percent (1 respondent) had started university but had not yet graduated.

Result

Current Job

The respondents had on average (mean) been working in their current jobs for 3.3 years. There was a slight trend that the older the respondent, the longer they had been in their current job. In all cases, the respondents had found their current job through some sort of social connection, either through family, friends or neighbors. For all, there was little to no application process, the jobs did not require prior skills, knowledge or training and thus with a connection, they could almost immediately start work.

Graph 2: *Length of time in job vs. Age of the respondents*



Typical stories of how respondents got into their current professions were:

1. The respondents' parents needed assistance from them. This could be because their parents were aging, the respondents had many younger siblings or the family had less money coming in. This story was the most common among the respondents who worked in-home or in family-oriented occupations, for example, market sellers, crop farm laborers or livestock and dairy producers.

2. Women who worked in construction-related jobs (bricklayers and construction workers) usually found their jobs through their husbands. Most often they started work with the purpose of supporting their husband and then did not leave the job.

3. Men who worked in construction usually found the job through friends or neighbors and often joined because they wanted to get additional money quickly and because the job would pay them daily.

4. For those in other professions, the jobs most often came about after seeing others doing it and being successful at it. Respondents would get inspiration from others, thinking that they could achieve the same and imitate them. This was the primary story of those in more independent or self-employed jobs; the street sellers, bakers, pastry-cooks, and confectionery makers, sewing machine operators, tailors, dressmakers, furriers, and hatters.

Across all 36 respondents, there were only two exceptions to the above. A 30-35-year-old baker in the city had learnt his skills by attending a course by the NGO PSE: Pour un Sourire d'Enfant.[67] This course had been provided to youth from poor backgrounds to give them workforce-related skills. He mentioned that there were lots of options for learning there but "I learnt to work at the bakery and become a baker, it was free and I learnt it for a year. After that, I worked for others before I started my own [business]. I chose it because being a baker is not a common job for most so I thought it would work for me." The other case, a 25-29-year-old construction worker in the city had chosen to learn graphic design skills at Don Bosco[68] but had left the course because the skill would have taken 3 years to acquire.

Current Job Satisfaction

The majority of respondents gave fairly satisfied scores (7 or higher) on their current job satisfaction. There are many reasons why the respondents are satisfied and are willing to continue with their current jobs.

1. The salary is enough for their family.

The respondents achieve personal incomes of around USD229 per month and household incomes of USD473, which for the women was about 46 percent of their household income and 49 percent for the men. Although they would like more money, the money they make is enough for them and their family to be supported in their daily needs.

2. The jobs provide them with daily payment.

Most of the workers are in self-employed and informal work and thus make money daily, there is; therefore, an immediate pay-off to their work. They do not need to wait for every half month or the end of the month to be paid. As their families are not wealthy and do not have many savings, they see this mode of income as preferential. Furthermore, it allows them to spend freely when they have a good day and achieve more income than they expected.

3. They are self-employed.

For all jobs included in the groups, except the construction workers and some of the sewing machine operators, the respondents would consider themselves self-employed, or at the least working for the family business, so the money that they earn is theirs, they are not working to make money for someone else. It is gratifying to be paid for the work that they do and earn for themselves rather than for others.

4. Flexibility to take holidays

These jobs provide the respondents with the flexibility to take holidays when they require them, for example, to be able to visit family in the provinces when they want or need to. One 25-29 year-old street vendor in the city

67. Pour un Sourire d'Enfant. PSE in Cambodia. Last accessed 30 October, 2020. https://www.pse.ngo/pse-cambodia

68. Don Bosco Foundation of Cambodia. Last accessed 30 October, 2020. http://donboscokhmer.org/

mentioned that he loved that he was selling from his motorbike as he could go and visit anyone or be anywhere and still make some income, "now I sell desserts so if I want to go somewhere I take my moto and I can still sell desserts, so I have so much freedom," he explained. Many of the men had, at some point previously, worked as security guards. They all disliked this as it only provided 2 days of holiday per month: "If I went to visit family in the province, it would give me less than one day there and when I returned to work I would have no other free time to use for the rest of the month, I could not go anywhere, I was so lonely" explained the same street vendor.

5. Free time to look after the household

What is of particular importance to the married women is, they noted, that they felt they were at a time in their lives when they had to choose a job which allowed for more flexibility. When the women married, they saw it as their duty to take a job with more free time to allow them to cook and perform other household chores. This was even more important to the women who had children as they knew they would have to work and look after children at the same time.

For example, a 30-35-year-old female tailor in the city, who used to sew in a factory but gave up that job so that she could be a stay-at-home tailor when she got married and had children: "I used to be a factory worker; I did that for 5 years. It changed when I married husband because I didn't have time to look after my husband with my previous job, so I quit to look after my family." Her new job gave her the ability to choose her hours, support her husband and look after her children while still bringing home an income.

Both women who worked in construction or bricklaying took this job so that they would be working at the same location as their husbands. "I was a factory worker before I got married to my husband. After I got married, I followed him. At first, I looked after my children but then I started to help my husband to make and prepare the bricks, my husband taught me to do so" explained a 30-35-year-old female construction worker. She further explained that he would typically take the more intensive jobs while she took on more of an assistant role at work so that she could still bring in an income whilst also supporting the children and finding time to shop, cook and clean.

Reasons for Being Dissatisfied

There were, however, 6 people who gave mixed scores (4-6) and 2 people who gave dissatisfied scores (lower than 4). The reasons for being unsatisfied were:

1. Wages are low

The primary complaint of those unsatisfied was that their salary was not as high as they would like. With their current income they are able to support their families but not to make enough to save or build for a more comfortable future. A 30-35-year-old male bricklayer commented, "In my field, because it is very labor intensive, it only earns a little money and it is hard to support my family."

2. Physically demanding work

Most of the respondents who joined the groups were in physically demanding jobs. Given the option, they would prefer to be a white-collar worker with the comfort of sitting in a cool place instead of being active in the heat or under the sun. "As long as I can get a new job that isn't labor intensive, I would be satisfied. I think I want to run a grocery store instead" explained a male 25-29 construction worker.

3. Being self-employed and not salaried have drawbacks

Working for themselves has many perceived positives, however, it is not a salaried job and thus if they miss a day of work they are not paid. There is no safety net for them if they were to encounter an unexpected medical or economic shock. Becoming sick and not being able to work were a huge concern for all of the workers in the groups, regardless of occupation.

Skill Acquisition

Almost entirely, the education and skill acquisition for their jobs, both past and present, came from either observation of others or on-the-job learning. There was only one respondent who had learnt skills for his job through an NGO course. Otherwise, all respondents would learn from observation of others whether on the job or not. For those in jobs with older or more experienced colleagues, they would watch them work and learn best practices through them. There was, however, no formal training. Only one of the respondents working for a company had seen any real progression of skills and had a path to further development. A construction worker who now specialized in ceilings had originally started out carrying bricks and over the years had progressed to a higher paid, more skilled job, working specifically on ceilings at his building sites. Again, this upskilling came from observation and learning skills by watching, rather than through any official course.

Those who were self-employed, for example, the market sellers, street vendors and tailors had learnt their skills by watching those around themselves and by participating in the field as consumers. "We can learn things from friends or family, those who are sellers or café owners, we can see those who do it and we can observe how they do, we don't need to go to school to learn this" remarked a 20-24-year-old male market stall salesperson.

Previous Jobs

The respondents typically found their jobs through their close networks. There was a large spread in the number of earlier jobs that respondents have undertaken. For some, they came into work through their family at a young age and have never changed professions. For others, particularly the males, they may have worked in numerous fields unrelated to each other. A 25-29-year old street vendor in the city, for example, had previously been a construction worker, a tuk-tuk driver, a security guard, a moto driver and a farmer.

The previous jobs that respondents had worked on were common among the groups and were similar regardless of their current job. Many of the males had, at one point, been a construction worker, farmer or security guard. Many of the females had been factory workers previously. Among both males and females some had been street food vendors or market stall sellers. The jobs that these respondents have worked in are thus, to a degree, interchangeable. They all require little training or skill to obtain the job and these jobs are currently plentiful in the country.

The most common reason for a woman to switch jobs was due to getting married or having children and thus wanting to spend more time at home, be closer to the family or in a job that allowed for flexibility. For men, the reasons varied to greater degrees; the need to be closer to home did come up but a change in occupation also came about due to being bored with one's work, disliking colleagues/superiors or being offered a better work opportunity elsewhere.

It is worth noting that the jobs that workers switched between were most often lateral in progression. A worker changing from one job to another might be doing so not because it pays more or has more responsibility but because it is closer to home or is perceived as being less tiring. For most, the jobs that the respondents have been working in were not stepping-stones as part of any aspirations or ambition but rather jobs that they had fallen into. As the workers are all in fields that are self-employed or are routine tasks there is very little upwards progression possible without changing careers completely.

Fear of Losing Employment

The fieldwork for this research project was undertaken between 11-13th September 2020. Although the Cambodian population has been largely unaffected by the effects of Covid-19 (Cambodia was at 275 total cases with 0 deaths at the time of the groups), the economic impacts of the global downturn have been clear in Cambodia with many restaurants and factories closing their doors. It was expected that the respondents may have a fear of losing their jobs due to Covid-19, if not from impending automation.

The respondents in many situations had felt the economic effect of Covid-19 through the reduced demand for goods; the tailors, in particular, noted that they had fewer customers recently than before the pandemic; "Things are getting worse, due to Covid-19 I don't have a lot of customers. A lot of weddings and events are cancelled so I lost a lot of customers" explained a female 30-35-year-old tailor in the city. Street food vendors and market sellers had also noted a downturn in custom for a time but felt that it was returning to normal with less fear in the population about the disease. "Due to Covid-19, I have been making less money as the nearby factory workers haven't come to buy my vegetables. However, I am not concerned that I could lose my job" commented a female 20-25 market stall seller from the semi-urban area. Regardless, the workers had not been worried about being able to make ends meet.

The reason for their confidence was that they had easily obtained their current job. As mentioned previously, most had switched through several jobs in their lives already. They found jobs opportunistically and with ease. Should something happen to their current job, there was no fear in their mind that they could not find another job. For example, those who were tailors saw that if their customer numbers continued to drop, they could fall back on returning to factory work. "I would go back to being a factory worker as I have experiences doing that." Those who were market stall sellers or street vendors could not think of anything which would result in them stopping being able to sell food to people as "People will always have to eat." Those in construction have seen the city continue to develop and could not imagine something which would stop development altogether. One construction worker thinks the situation is even improving: "I think construction hasn't been affected by Covid-19. I think things are still the same but the prices are getting higher. In the past I would only get USD2.5 per day" claimed a 20-24-year-old male bricklayer in the city. They had seen constructions fail before and had seen the workers on that site lose their job, but there had always been other construction sites they could move to. Should even that fail, they could fall back on being a security guard, driver or loading goods "it would affect me but there are other things I can do, as long as it is legal I can do anything" stated a male 25-29 construction worker.

The respondents had little care about whether they were to continue in their current occupation or to switch to another. There are countless jobs available to these workers, all of which are of similar skill, ease

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to find, difficulty in labor and monetary value: "I think that with the other things that I can do, the money I earn won't be much different" clarified a 30-35-year-old male construction worker. Ironically, it is Cambodia's high rate of vulnerable employment which provides those within vulnerable employment their perception of job safety.

Reasons for Stopping Education and Starting Work

Of the respondents, none had yet completed higher education, one was currently attending evening classes and one had the intention to attend university once he finished high school this year. The respondents' reasons for stopping their education at a young age were intrinsically linked to their reasons for starting work and as such are analyzed together below.

1. They had to conclude their education in order to help out family business

The most common reason for the workers being in their particular jobs was that they had inherited the work from their family; their parents were doing the same job but as they aged they were struggling to fulfil the work requirements alone and so encouraged their children to help take over, passing on the work to them. This reason was especially common among the women and those who are the elder offspring of a family, "I did it to support my family, that is why I am selling vegetables. First I just stayed at home while my mum sold vegetables but she was getting older so I started to help her to sell vegetables, other than that I would also help to look after my younger siblings" explained a female 20-24-year-old market stall seller. The older siblings, especially if female, are put to look after the home business, the siblings and household. Within these cases, it was often pointed out that they wouldn't have the money to continue their education and by helping out with the family work they could save or earn more money instead of spending it on their education.

2. Could not afford to continue education, started work out of necessity

In a few cases, the respondents expressed that they would have liked to continue their education, however, they had to quit their schooling to assist the family in making more money. The family could not afford for them to continue their education. In these cases, they may often have started working to continue their parents' or relatives' job, as above.

3. There is little point in attending school, I should start working instead

On the basis of those around them, some see little point in pursuing further education. This comes from 2 perspectives:

1. They see that it is the only possible way to achieve a good job in Cambodia, if you are well connected or have access to large amounts of money. They think that without engaging in corruption, it is not possible to achieve these top jobs, so they think that even holding a degree will not influence their lives.
2. Others point out that many students who have finished university "still end up in a USD200 a month job." Although this may be true of some graduates, the respondents don't realize that these are entry-level jobs and most graduates will increase their salaries from this point on and in later years will be able to make much more than this.

4. They did not have the talent for it

A common belief among the respondents was that skills in learning were a purely naturally gifted trait. "I do not have talent in education" or "My memory for learning from books is not good" were frequently repeated phrases. The

respondents did not believe that they could achieve success in school and so decided it was time to leave and join the labor market. Their understanding is that education is not for everyone.

5. The lure of getting money in the short term was more appealing than waiting to achieve a better wage and earning more money later.

Many of the male respondents were lured into leaving school upon seeing their friends not going to school furthering their education and instead of making money. Simply the lure of quick cash instead of a longer pay-off convinced them to leave school. Getting paid daily is a guarantee compared to spending years in education for a potential payoff later. What they know from their environment is that others with low-level education work and make money. In these cases, they are usually encouraged by friends or family that education is not important and that they should rather start working.

In all cases, the respondents mentioned that they were not 'forced' to leave education but that it was their choice. However, it was also clear in all cases that these were not decisions that they made on their own. Their family and friends certainly had an impact on their decision and in most cases they were pushing them toward work instead of education.

Interestingly, as they have grown older, some have started to value education to a greater extent. A few of the respondents across the groups said that they wished that they had stayed in school longer and had come to regret their decision to leave now, "I could not catch up with the education, I was too lazy to study, my parents didn't force me to quit, I just didn't like studying, I kind of regret it now. I think my family could have afforded me to continue, I just didn't want to study" explained a male 20-24-year-old construction worker. Ultimately, for some, even with their regret of not having obtained a full education, they still believed that they did not have the talent for it anyway and thus it was not a real loss to have left: "I think I don't have a good memory, my brain does not function well, I don't have the ability to catch up" claimed a 25-29-year-old female baker, cake or confectionery maker. Others still did not value education and were quite content with their decision to leave at a very young age. "My parents cannot afford my education, so they got me to stop. I quit and I don't have any regrets. My parents told me to strive for my own life. You could get higher education and still be a rice farmer so I was happy to quit and become a worker and earn my own money and spend the money I earn." explained a male 30-35 street food seller.

Children's Future

It could reasonably be expected that the respondents would, when asked about their children's future, suggest that they wanted their children to be very successful, wealthy and powerful, however, the reality was quite different. Many respondents expected their children to assume their occupation, as they had from their own parents. As they had thought about their own education, only some realized the value of it and wanted their children to continue in school and obtain an employment which would provide them with more wealth in the longer run than they had achieved themselves. "My wife is a dentist and I think that her job is good, and I want my children to be in her field. I do not want my children to work in my field because it is very labor-intensive, it only earns a little money, and it is hard to support my family. Other jobs will have more opportunity to grow rather than being just a construction worker" explained a 25-29-year-old male.

The key issue is that, apart from two, the respondents, whether they were parents yet or not, saw education as something that came from nature rather than nurture. "I think that education and skills are important, but it depends on my children. If my child is smart, not like me, then I will support them to get into further education" explained a 30-35-year-old father who works as a street food vendor. Surprisingly, the parents did not think that additional training or special care could support their children to get into higher education if they were not born with the natural ability to take to it. Across all groups, the popular opinion was that their children should each achieve a high school education, however, even then it was still with the caveat "if they have the talent for it."

Their intention is to support their children through school for as long as they can, all the way through university as long as their child has a natural ability for it. If not, they expect them to leave education and enter the workforce. They leave their children's education to their children's appetite for school and they do not show an inclination to push their child to learn, as a 30-35-year-old livestock farmer clarifies "it depends upon the level of the child, how smart they are." It is clear the respondents and now their children are not being raised in an education-friendly environment.

Attitudes Toward Education and Upskilling

Only some of the respondents understood that education is important to achieve high-value and a skilled job. Some regret that they did not continue their education: "I saw others making money in the factories and I wanted to get money to help my family. When I was young, I had a short vision, I wanted to earn money and make money then. If I knew then what I know now, I would have continued because you can earn so much more if you continue. I regret it now" remarked a 25-29 female street food vendor in the city. However, this viewpoint is not very widespread. Within the groups, education was appreciated more by those who had more education. Those with only primary or an informal education saw little value in it whilst those who had completed high school, understood that it held at least some value. A 30-35-year-old market stall seller explained, "it depends on my children and whether they want higher education or not. I am not sure about it because my education is low and so I don't know what my children should be."

As shown in the respondent information table, only 42 percent of respondents had completed high school education. Across all six groups, only two respondents had a connection to higher education, one boy was currently in his 3rd year at Norton University studying management and another was in the process of finishing high school and intended to study English at a university once he had completed his high school education.

Interestingly, there was a correlation between these two students when compared with the other respondents. The crucial difference between those achieving higher education and those who did not was their parents' interest in education. The other respondents did not see a need for themselves to go to university or to send their children there if they did not "have the talent to do it." The two exceptions shared how their parents had been pushing them to achieve an education from a young age and wanted them to "not have the same job as them when they become adults". One of the two boys mentioned how his family was not religious but that he had been sent to Christian Church as they would teach him English and other skills that could help him achieve a better life. "I have been lucky that my family and siblings have pushed me into getting more. However, it comes down to you.

You must be clear in what you want and to push yourself. I went to church because my family pushed me to go there, they wanted me to go anywhere that would help me to study and learn" commented the 20-24-year-old bricklayer. Both of these men are currently in high-risk of automation jobs, one is a farmer and a bricklayer, but these jobs are a means to an end and once they complete their university courses, they hope to find other jobs.

The differences are clear, those going to university, at least from this small sample, have parents who want them to have an education and for their children to not have the same occupations as themselves. The indication from this research is that the key difference in the respondents' attitudes toward education and upskilling is learnt from their parents and instilled in them from a young age.

Awareness of Education and Training Methods

The methods of attaining education and skills the respondents were aware of are:

1. School and University
2. Learning from friends and relatives
3. Learning from observation or the surrounding environment
4. NGO or community workshops
5. NGO training courses (e.g. Don Bosco and PSE)
6. Online learning (e.g. school lessons happening during Covid-19)
7. Online learning through YouTube or Facebook pages
8. Learning from books

Although the respondents have attained awareness of the above methods, they have little inclination to learn from any of these sources besides learning from friends, family, and observation of their surroundings. Their education stems from informal means by people they know.

The primary issues are that the respondents do not think they have the time to learn and that they do not have the money to be able to afford any further learning if it is not free "because of my living standard I don't have time to learn it and if I were to go to school I cannot afford it" said a male 25-29-year-old construction worker. The respondents see that through work, family, and household responsibilities their time is all accounted for and they cannot spare additional time for learning. With any of the above training options, if the cost is a factor the respondents will not pursue them. They are living from month to month. Those with savings are intending to put money toward a business, their children's education, or their future. The risk of spending money on learning without a guaranteed payoff is too much for them to contemplate. More specific barriers, for the individual methods included:

1. Schools and universities:
These are too intimidating for the respondents to join now: "I am really shy; it would embarrass me that the child would learn better than me" clarifies a 25-29-year-old female tailor. The respondents see education as only for children and once you have passed your early 20s the moment has passed. Even when probed with the suggestion of adult-only classes, the respondents think it is too late for themselves to attend.

6. and 7. Online learning through lessons or online pages:
Online learning through either official classes or free videos are unappealing for the respondents. For those who have children, due to the government's Covid-19 response closing schools, the parents have seen their children learning via online or remote

learning and they think that it is ineffective. "You must supervise them when they are online learning; otherwise, they just play on their phones" explained a 25-29 female tailor. They also point to the fact that if they were not talented at learning when they had a teacher present and learning materials with them in person whilst at school, the chances of them learning at home alone are improbable: "If I don't have any guidance or stress I will not work. When I was young, I needed my mum to guide me. Nowadays I see the children doing it all themselves. For me it wouldn't even be 5 percent effective" commented a 30-35 female street food seller. Some respondents have, at times, learnt through the use of YouTube. Examples given were typically on how to perform household tasks better, for example, how to cook specific foods. They did not see this as a long-term solution for learning a difficult skill though. Even if online materials are available freely to access at their convenience from within their home, for example as YouTube is, they don't think that they will be able to devote the time or attention necessary to learn it.

8. Learning from books:
Reading is not an option for the respondents as they typically do not enjoy doing it and remember from their school days that they are not very good at learning or remembering through this method.

Future Occupation and Ideal Work

The jobs the respondents could see themselves changing to were close to what they have already accomplished. Their 'dream jobs' were all achievable and typically required no significant skill improvements. For example, the bakers wanted to open their own bakeries, the market sellers wanted to start selling at wholesale levels, the street vendors wanted to save up enough money to rent a shop front and set-up a permanent location restaurant, some of the construction workers wanted to save enough money to buy a tuk-tuk and begin working for ride-hailing apps like Grab and PassApp. "I have always planned to change my job; I plan to switch because I do not see any opportunity to grow as a construction worker. I have a family; my children are growing, and I need to support their education. In the future I may change my job, I am trying to find a solution and a way out. I am planning on buying a PassApp and being a PassApp driver. If I cannot afford to buy one, I will rent a PassApp first. I think this will increase my salary and help my family" described a 25-29-year-old construction worker. "I plan on opening a grocery store with my wife but right now I don't have enough capital to open the store. Maybe 3 or 4 more years with crops before I can do it" said a male 30-35-year-old crop farm laborer.

Once probed as to what their dream jobs as children were, they were most often no different; however, some did, at one point, have higher aspirations. The higher aspirations were typically to be government officials, teachers or doctors/nurses, the jobs that have often been thought of as respected in Cambodian society. Government jobs, in particular, are considered prestigious for the family, even if the job is not very well paid, it provides a stable salary and a retirement pension which can support the family in old age.

Why Not Switch Careers?

The respondents did not think of any skills that could be learnt which would lead them to switch to a more advantageous career with higher and more stable incomes. Across the groups, there were three interconnected reasons provided for this:

1. It is too late for them
They think that their time to learn has passed and they do not have the ability, time or money to be able to achieve a well-paid career.

2. Little ambition
They are satisfied with what they have and what they have achieved. They have little drive or ambition to change to another career.

3. No understanding of how to achieve another career and little understanding of what careers even exist
When asked which high-level careers exist and how to enter them, the respondents showed little knowledge or understanding. Classic careers like doctor, nurse, government official and teacher were mentioned but there was little knowledge of other well-paid jobs. The respondents also showed a poor understanding of how one would go about entering these fields of work. The common answers given were money and connections (or explicitly corruption). Two of the respondents clearly said, "I see others doing jobs that are less hard and make more money than me. I see others running a business and it looks a lot easier than what I do" and "Some other people have their big business while working as state officials and I want to be like them as well. I want to reach my dream by being like them and earn more money. Some people have a lot of money and I wonder what are they doing to earn a lot of money?"

In all cases, as with their reasons for not continue studying or skill upgrading, they see the primary barrier to achieving these jobs as not having the right social connections and not having enough money.

Skills Worth Learning

There is a common belief among the respondents that to run a successful business is easy. It does not take skills, it simply requires enough capital to get started. Most of the respondents are self-employed or small business owners, the exceptions being the bakers, construction workers and some of the sewing machine operators. They think that to work for someone else requires education but to own a business primarily requires money. For example, multiple market sellers have an ambition to eventually have enough capital to be able to sell wholesale. A street food vendor wants to become a caterer at weddings but needs money to expand. Even the respondent who had gained skills in his occupation and now specializes in ceiling work at construction sites sees the only way he can improve is by saving enough money to hire others and become a contractor. Consistently, improving their businesses is understood to come primarily by acquiring more capital not through upskilling. The only skills that the workers would consider learning would be in support of their small businesses or to alleviate living-costs.

Many of the men were interested in learning motorbike repair skills. However, only a few of them saw this as a useful career path, it was more often considered as a side job for them to fix neighbors' motorbikes or for them to save money if they were able to fix their own bikes when necessary. Those in the farming or livestock rearing occupations would like to know better techniques for growing crops and raising animals to increase harvests or to sell at higher prices; "I would like to have a topic on how to sell well. I only want to know how to earn more money" claimed a female 30-35-year-old market seller.

Languages were of interest to the respondents but as aforementioned, the respondents do not feel as though they have time to learn. They are aware of learning materials available online on places such as YouTube but only a few of them have an interest in pursuing this. They do all see at least some value in learning other languages and see the possibility to sell more products or scale up their business if they can speak either Chinese or English.

The indication from this research is that full-scale career development and change is not feasible among this target group as it would appear that none of these workers have any interest in it, even if provided to them for free. An idea is to support these workers within their current jobs and skills rather than to upskill with the goal to change the profession. The goal would be to identify key skills for simple innovations like public speaking, languages, sales and marketing tactics, budgeting, computer skills and soft skills. Although improving these skills will not take the workers out of high-risk occupations it will improve their skills within their field and provide them with more survivability in the market.

Understanding Job Automation

The respondents have never considered the thought of job automation before and when probed with the idea, they did not think it's relevant for themselves. In Cambodia, they have experienced some automation, but none that has resulted, at least to their knowledge, in the loss of someone's job. It is important to note that automation has likely resulted in the loss of jobs in Cambodia; however. Cambodians, especially those in low-skilled occupations such as these, change jobs so frequently and for a myriad of reasons that it is hard for the respondents to have been able to identify automation as a cause.

For example, those who work in construction and bricklaying can point to cement mixers doing the work that would have previously been fairly arduous manual labor. However, they also point to the fact that it still requires a human to put the cement into the mixer and to take it out. Furthermore, those who work in bakeries say "now we have ovens instead of fire" which makes the process more simple, but it "still requires people to make the bread or confectionery, to begin with." Those who operate sewing machines and work as tailors can see that machines now cut clothes that used to be cut by hand, but they still believe it is necessary for humans to sew, design and measure clothes.

The main location that the workers can see automation taking away jobs is within agriculture. The respondents pointed to the fact that fewer people work within agriculture than they used to. They have also noticed an increase in the number of tractors and other machinery being used for work which previously would have been undertaken by hand and animals.

In other sectors, they cannot imagine how automation will take away jobs. They have not experienced it and have trouble imagining it without a clear point of reference. In all examples, the respondents point to the machines making the human workers more efficient and quicker in their jobs but not removing them completely. The respondents still think humans are essential and will continue to be essential for jobs to be performed. They don't think that machines will be able to do manual jobs, occupations like sellers and handicraft workers cannot be replicated by machines as they do not have the dexterity of hands or the ability to talk to customers, "I think human hands can cut in factory better than a machine, I don't think machines can replace my work, we need humans to do it, for sewing we can use a machine but we still need humans to do it" claims a 25-29-year-old female tailor. A male 30-34-year-old vendor explains; "Selling things involves hands, hands cannot be replaced by machines." As such, when probed as to which jobs stand the best chance of surviving through automation the respondents do not choose high thought level jobs, they usually consider low skilled and manual labor jobs such as their own.

Even after being probed about automation, the workers interviewed still have no fear of

losing their jobs. They have little belief that they could lose their job to automation and still have faith that if they were to lose their job through automation or other means there would be plenty of alternative occupations for them to consider. A common career for the men to fall back on was within agriculture, ironically the occupation they also see as being most likely to be automated, as they believe that as long as they can obtain a patch of land in the province they will be able to survive off the land.

When asked about other countries, the respondents can identify that other countries use less manual labor and nowadays use more machines, however, they say that people in these countries still have jobs. Besides, they consider that Cambodia is so far behind the developed countries that use lots of machines that it is not something for them to consider yet.

Conclusion

Digitalization is a big threat to achieve the Sustainable Development Goals (SDGs) in Cambodia and automation is problematic for the inclusiveness of the Cambodian Labor Market. Many workers in routine tasks at some point in the future are at risk of losing their job. Even more worrying is that they are not aware of the direness of their situation and have no intention of upgrading their skills. As the findings show the problem does not only lie in the supply side of high quality and affordable education, but also in the demand side, due to a lack of awareness and motivation by the workers. Corruption plays a crucial role as it creates problematic role models. Wealth is not connected to education, but to corruption. Policies created have to keep both sides in mind.

The research design has certain limitations. Among others, the results of focus group interviews are not representative of the whole Cambodian population. Another aspect the study could not provide is assessing differences between certain socio-demographic factors, such as occupations, economic sectors, age, and gender. Further research needs to be done to test the hypothesis the study has found and which are outlined below:

Hypothesis 1:

The majority of workers in high-risk occupations are not aware of the risk of future job loss.

Hypothesis 2:

The majority of workers in high-risk occupations are not upgrading their skills.

Hypothesis 3:

The main obstacles for further education are motivation and confidence in their innate ability to learn.

Hypothesis 4:

The majority of workers in high-risk occupations feel comfort in the knowledge that there is a huge portion of the population who are also unskilled and so there are many similar jobs available to them should their current work fail.

Hypothesis 5:

Aspirations of workers in high-risk occupations are usually within their immediately achievable grasp and do not require upskilling or further learning but could be further supported through financial or entrepreneurial support (e.g. mentorship).

Hypothesis 6:

The younger generation is more ambitious to upgrade their skills, than the older generation.

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Hypothesis 7:

Training on the job programs are more successful than higher education programs.

Hypothesis 8:

Parents are the most important target group for com-municating the value of edu-cation to their children.

Recommendations

On the supply side, the quality of Cambodian schools and universities do not hold up to international standards; according to a study in 2013, approximately 48 percent of fresh ICT graduates did not have the skills to work effectively.[69] The Government of Cambodia seems to be aware of the need for better education as a statement from the Prime Minister Hun Sen in June 2019 shows: "The technological advancements of the Fourth Industrial Revolution will cause job losses but also create new ones. To retain their jobs, one needs to broaden technical knowledge and strengthen skills. (...) We have no choice but to boost capacity and skills in the workforce."[70] There are several ways to achieve this. It starts with early education in particular; there is a need for the curricula to be updated to catch up with the needed skills in addition to the construction of further schools to accommodate the growing population. Furthermore, the potential of online learning should be used to greater effect, especially in rural areas.[71]

An analysis of the current situation in higher education reveals an alarming mismatch between education and employment: the most popular areas of study among Cambodian university students are social sciences and business-related majors. Only a small percentage of students are studying science, engineering and agriculture, which are considered to be key skills to foster the growth of the Cambodian economy.[72] In addition, international accreditation of the Bachelor and Master programs is needed. There ought to be more international exchange of students and researchers. With higher automation in the garment sector, more modern skills are required in the factories as the tasks continue to become more demanding. For example, more engineers and IT-experts will be needed in the future. Also, further vocational training in the garment sector is crucial to upgrade the skill level of the workers. There are already initiatives from garment associations like the Cambodian Garment Training Institute which focuses on skills development, namely garment construction experts (pattern making and adaptation); garment production engineers (manufacturing processes); apparel merchandisers (garment designers); and quality assurance specialists (quality controllers).[73] The government could boost these initiatives to educate more workers. There is a high potential in the cooperation with development partners like Germany which have a high-quality vocational training system. Learning on the job seems to be a more successful way than switching career paths. As the focus groups show, there is a lack of imagination that education could lead to higher income.

69. Pheakdey Heng, Preparing Cambodia's Workforce.

70. Voun Dara, PM: Workers must train for Industry 4.0, Phnom Penh Post, June 14, 2019, https://www.phnompenhpost.com/national/pm-workers-must-train-industry-40.

71. Ausarbeitung Digitalisierung und Entwicklungspolitik.

72. Pheakdey Heng, Preparing Cambodia's Workforce.

73. World Bank, Cambodia Economic Update, Enhancing Export Competitiveness: The Key to Cambodia's Future Economic Success, October 2016.

Cambodian universities should move from being purely teaching institutions to research institutions that drive innovation. Inventiveness is needed for modern economic development.[74] At the moment research and development in Cambodia is more often coming from abroad. Improved and more focused research and development will lead to more efficient processes in the factories and could create more businesses around the sector. This in turn could bring more parts of the value chain into Cambodia, leading to a more diversified job market.

This lack of infrastructure is also one of the reasons that the high potential of online learning is not used. Online learning, especially Massive Open Online Courses (MOOCs) provide an easy to access way to upgrade the skill level of workers in Cambodia and could provide strong benefits to Cambodia if implemented. However, an often required skill to access the knowledge of the world is understanding of the English language as the majority of MOOCs are held in English.[75] This has also been noted by Cambodian enterprises as they answered in an ILO survey that missing foreign language skills are "the most critical" in Cambodia.[76] In the sense of the learning-to-learn approach, education in Cambodia should focus on the basic skills that open up the world of knowledge, especially English language skills and the infrastructure (electricity, fast internet and the availability of devices) to get there.

There is a need among the respondents interviewed for flexibility in work to accom-modate their families, especially among fe-males, and to achieve an inclusive labor market. It should be made easier for workers in high-risk occupations to educate themselves. Low-skilled workers "need financial and temporal flexibility and support so that the transition from old to new occupations can be managed successfully and those who struggle to cope with the speed of technological progress are not left behind. Functioning social security systems are therefore more necessary than ever. However, should (paid) work lose so much economic importance that it no longer guarantees broad economic inclusion and an adequate income distribution, further mechanisms of income (re)distribution will be needed to maintain social cohesion."[77]

To face such a challenge, current efforts by the government are not enough. Policymakers, employers and training institutions need to work together to improve the skills of the workforce. Promoting academic pursuits in STEM will be vital in meeting the higher skill demands required to maintain and run automated machines, particularly among young women who would be greatly impacted by the technology uptake in the Cambodian garment sector.[78]

To make more people willing to upgrade their skills and raise awareness for the potential and opportunities of education the demand side plays a crucial role. The concepts of learning-to-learn and lifelong learning should be at the core of the messages sent by the government in all education-related communication. These messages also need to be narrowed down toward the specific requirements of high-risk workers. These workers must be informed about the future outlook of their occupations. They should be

74. Silvan Rehfeld, Digitalisierung in der EZ.

75. Riccardo Corrado and Patchanee Tungjan, How Digital Tech Can Help Fix Cambodia's Broken Education and Healthcare Systems, in: Digital Insights. E-Governance in Cambodia, Robert Hör, Christopher Perera, December 2019.

76. ASEAN in Transformation, How Technology is Changing Jobs and Enterprises, Cambodia Country Brief, https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_579672.pdf, April 2017.

77. WBGU – German Advisory Council on Global Change (2019): Towards Our Common Digital Future. Flagship Report. Berlin: WBGU.

78. ILO: ASEAN in transformation: Perspectives of enterprises and students on future work.

guided toward the educational offers that are available from state institutions, the private sector and through e-learning. To shape these awareness campaigns the government needs a clear picture of which skill levels will be most impacted by job losses in key sectors. The government should precisely establish and communicate re-training programs for displaced workers. Those training programs demand to be shaped in light of emerging technological developments and the core skills (and new skills) necessary for predominant sectors. The education and training providers need to offer forward-looking training according to the changing enterprise skill needs.[79] As the Cambodian economy is based on exploitation and not exploration strategies it is difficult to predict skills achievable for low skilled workers. The potential upgrade of the skill level needs to be realistic: A street seller will probably not become a software engineer.

Therefore, efforts also certainly need to be put into changing workers' perceptions of what is possible for them to achieve and why they should achieve it. Three key challenges in upskilling or further educating workers is that,

1. they do not understand what highly skilled and low risk jobs are and those that do know do not understand how to achieve them;

2. they do not believe that it is possible for them to achieve higher education due to their innate abilities or lack thereof; and

3. They do not connect wealth with education. Therefore, role models need to be developed, as they can inspire people to educate. The dangerous connection in the perception between wealth and corruption needs to be corrected toward wealth and education.

The results of the focus group research paint a rather defeatist view as respondents were unreceptive toward engaging in further education or upskilling. At the respondent selection stage of this research project, respondents were chosen within the relatively young age group of 20-35 because it was perceived that the younger the respondent, the more likely they would be to harbor the ambition to continue skill upgrading. This was, in part, true. The younger respondents certainly showed more inclination toward gaining further skills. However, less so than had been anticipated. Ultimately, skill upgrading and further education to remove a worker from a job with a high likelihood of being automated appear to have little hope of being successful. That does not mean, however, that these workers cannot be helped. They are somewhat perceptive to gaining new skills, only just within their field or when it comes to soft skills deemed useful for their current career path. These types of skill-upgrading will not remove the workers from the firing line, but will provide them with more skills to maintain survivability in the market when other less-skilled workers in the same field are being replaced by machines. Many of the respondents showed entrepreneurial spirit and wanted to expand upon their work or possess their own businesses. They are flexible and they are owning their business, which is related to their close environment. This is a hindrance to formalize the labor market, but this flexibility gives the chance to upgrade their business via access to finance via micro finance, which later could lead to a formalized business. Efforts should be made by the Cambodian government, NGOs and enterprises to support this spirit by minimizing barriers for business development, providing easy to access and low interest loans, and entrepreneurial support (e.g. mentorship, networking, etc.). To guide this process, programs are needed to provide the additional skills required to run a

79. Time to Act for SDG 8: Integrating Decent Work, Sustained Growth and Environmental Integrity – International Labour Office – Geneva: ILO, 2019.

growing business: administration, accounting, leadership etc.

However, the real opportunity suggested by the results of this research is to focus on these high-risk occupation demographics, but not as the primary targets of skills upgrading or education, but as the targets of marketing to instill within them the importance of education for their own children. Albeit from a small sample size, it was evident from the focus groups conducted, that those who saw the importance of education and skills to achieve gainful employment and wealth attained this notion from their parents. From all other respondents, it was clear that both they and their parents before them, under-valued education. The perceptions of the social and economic barriers to upskilling an adult are very strong and put in place an almost unachievable challenge in the eyes of the respondents. It is the recommendation of this report, therefore, that the efforts should be placed into the next generation of workers. The key to achieving this is to focus efforts upon current age adults to impact their decisions regarding their children. To make sure that adults support their children to attain sufficient skills and education, and not to encourage them to stop their education or enter the same employment as themselves. Unfortunately, the scope for improving the skills of those over 25 in these occupations appears to be low, but it would be a pro-active move to focus on helping the next generation. A concerted government, development partners and media effort in the form of an education first for a sustainable future campaign might be a good first step.

The private sector needs to contribute as well out of pure self-interest in the future. As such, the changing landscape of technology-prone sectors challenges the status quo for enterprises in terms of the way they function and their employment needs. To remain competitive, enterprises need to position themselves as adopters of enabling technologies and consider a more rigorous assessment of their workforce development strategy. In doing so, the following six questions could be considered:

1. What are the major technological trends and projections in the sector?
2. What is the speed of these technologies' application?
3. What are the main factors that influence these technologies' implementation? (wages, productivity, quality, government incentives, and reshoring initiatives, among others)
4. If faced with a skills shortage, can technology play a role in addressing the shortage?
5. How will enterprise skill needs change when these technologies are adopted?
6. What new skills will be required and which will become less relevant?[80]

80. Time to Act for SDG 8: Integrating Decent Work, Sustained Growth and Environmental Integrity – International Labour Office – Geneva: ILO, 2019.

Annex

Full respondent information

Table 1: Full respondent information

Group	Location	Gender	Age Group	Job Category	Education Level	Marital Status	Children	Personal Income	Household Income
G1	Urban	Female	20-24	Stall and market salesperson	Primary	Single	No	151-200 USD	351-400 USD
G1	Urban	Male	20-24	Street food seller	High School	Single	No	151-200 USD	301-350 USD
G1	Urban	Female	25-29	Bricklayers	Secondary	Married	Yes	101-150 USD	401-450 USD
G1	Urban	Male	25-29	Street food seller	Secondary	Married	Yes	151-200 USD	401-450 USD
G1	Urban	Female	30-35	Tailor, Dressmakers,Furriers	Secondary	Married	Yes	251-300 USD	551-600 USD
G1	Urban	Male	30-35	Bricklayers	Secondary	Married	Yes	151-200 USD	401-450 USD
G2	Urban	Male	20-24	Stall and market salesperson	High School	Single	No	251-300 USD	451-500 USD
G2	Urban	Male	20-24	Stall and market salesperson	Secondary	Single	No	50-100 USD	251-300 USD
G2	Urban	Male	25-29	Construction worker	Secondary	Married	Yes	151-200 USD	401-450 USD
G2	Urban	Male	25-29	Construction worker	Secondary	Married	No	151-200 USD	401-450 USD
G2	Urban	Male	30-35	Bakers, pastry cooks and confection	High School	Married	Yes	451-500USD	801+ USD
G2	Urban	Male	30-35	Street food seller	Secondary	Married	Yes	301-350 USD	601-650 USD
G3	Urban	Female	20-24	Bakers, pastry cooks and confection	High School	Single	No	101-150 USD	351-400 USD
G3	Urban	Female	20-24	Street food seller	High School	Single	No	151-200 USD	351-400 USD
G3	Urban	Female	25-29	Street food seller	High School	Married	Yes	201-250 USD	351-400 USD
G3	Urban	Female	25-29	Stall and market salesperson	Secondary	Single	No	151-200 USD	451-500 USD
G3	Urban	Female	30-35	Construction worker	Primary	Married	Yes	251-300 USD	351-400 USD
G3	Urban	Female	30-35	Sewing machine operators	Primary	Married	Yes	201-250 USD	601-650 USD
G4	Semi-urban/rural	Female	20-24	Sewing machine operators	Secondary	Married	No	251-300 USD	601-650 USD
G4	Semi-urban/rural	Male	20-24	Construction worker	High School	Single	No	151-200 USD	351-400 USD
G4	Semi-urban/rural	Female	25-29	Tailor, Dressmakers,Furriers	High School	Single	No	151-200 USD	301-350USD
G4	Semi-urban/rural	Male	25-29	Crop farm labourers	High School	Single	No	201-250 USD	401-450 USD
G4	Semi-urban/rural	Female	30-35	Street food seller	Secondary	Married	Yes	50-100 USD	301-350 USD
G4	Semi-urban/rural	Male	30-35	Livestock and dairy producers	Secondary	Married	Yes	201-250 USD	401-450 USD
G5	Semi-urban/rural	Male	20-24	Bricklayers	High School	Single	No	151-200 USD	351-400 USD
G5	Semi-urban/rural	Male	20-24	Construction worker	Secondary	Single	No	151-200 USD	351-400 USD
G5	Semi-urban/rural	Male	25-29	Livestock and dairy producers	High School	Married	Yes	401-450 USD	551-600 USD
G5	Semi-urban/rural	Male	25-29	Crop farm labourers	Started university but not graduated	Married	No	251-300 USD	651-700 USD
G5	Semi-urban/rural	Male	30-35	Stall and market salesperson	High School	Married	Yes	201-250 USD	451-500 USD
G5	Semi-urban/rural	Male	30-35	Crop farm labourers	High School	Married	Yes	401-450 USD	551-600 USD
G6	Semi-urban/rural	Female	20-24	Crop farm labourers	Primary	Married	No	251-300 USD	551-600 USD
G6	Semi-urban/rural	Female	20-24	Tailor, Dressmakers,Furriers	Primary	Single	No	201-250 USD	351-400 USD
G6	Semi-urban/rural	Female	25-29	Sewing machine operators	Primary	Single	No	151-200 USD	301-350 USD
G6	Semi-urban/rural	Female	25-29	Crop farm labourers	High School	Married	Yes	201-250 USD	451-500 USD
G6	Semi-urban/rural	Female	30-35	Livestock and dairy producers	Secondary	Married	Yes	351-400 USD	751-800 USD
G6	Semi-urban/rural	Female	30-35	Livestock and dairy producers	Secondary	Married	Yes	301-350 USD	701-750 USD

Focus Group Discussion Guide

Objectives

1. Understand the factors which make someone choose a job at risk of automation
2. Understand workers' knowledge of job automation
3. Understand workers' perception of their own job risk
4. Understand workers' attitudes toward education and upskilling to achieve job security
5. Create hypotheses for changing workers attitudes toward upskilling

(xx minutes) = minutes in section. (xx) = running total of group length

1. Introduction (10 minutes) (10)

- Introduce yourself
- Let them know there is no right or wrong answers we are only interested to understand their ideas, no matter what they are
- Thank them for coming tell them to be relaxed and just enjoy the discussion
- Tell them we will be recording them, but they won't ever be named or identified in any of the work
- Go around the group in order and ask them to introduce themselves with their:
  - Name?
  - Life situation (e.g. married, with or without children)?
  - Current job?

2. Current job (30 minutes) (40)

- How long have you worked in your current job for?
- How did you start working in your current job?
  - How did you find it?
  - What made you apply for it / join it?
- How did you learn the skills for your current job?
  - Probe: family, friends, school,

university, on the job, specific course.
- How many jobs have you had in total?
- What was your previous job?
  - How long did you work there for?
  - Why change from that job?
- Do you plan on switching jobs again? Why / why not?
  - If yes:
- When do you think you will switch jobs?
  - If no:
- How long do you think you will work in your current job?
- If short time: why not longer?
- If it takes a long time: why so long?
- What do you think your next job will be?
- (For those with children) What sort of job would you like your children to have when they grow up?
  - Why /why not the same as you?
- Do you have any fear about losing your current job?
  - Why do you think you will lose your job?
- What do you think could be done to help you keep your job?
- How would your family cope if your job was lost?
  - How easily could you find another job? Why/why not?
  - What job would you fall back on?

3. Attitudes toward education and upskilling (30 minutes) (70)
- What schooling level have you achieved?
- Why did you stop there? Why not continue further?
- (For those who were unable to continue) If you were able to, would you have continued on? Why /why not?
- What types of education or training outside of school are you aware of?
- (If not brought up already) Have you heard of e-learning?
- Have you had any further education or training courses since leaving school?
  - What were these?
  - What did they entail?
  - How did you find them?
  - Did you get any benefits from them? Why / why not? What were these benefits?
- Were you ever offered any of these training types to skill-upgrade?
  - Why did you / did you not take it?
  - What types of training would you be interested in?
- Would you consider completing any further education or training courses now?
  - Why/why not?
- What barriers would stop you from joining the training?
  - Get a group agreement on the top barriers that would stop them from joining.
  - How could these barriers be alleviated?
- (For those with children) how much education would you like your children to achieve? Why this much?
- Can you speak any other languages?
  - Which ones?
  - How well?
  - How did you learn it?
  - Any interest in learning one/ others?
  - How would you go about learning another?

4. Job satisfaction (30 minutes) (100)
- "I am going to hand each of you a piece of paper, I want you to write down how satisfied with your current job on a scale of 1 to 10, 1 means not at all satisfied and 10 means totally satisfied".
  - What makes a job satisfying to you? Please tell me your ideas.
  - Collect scores and write how

many scored each number on the board.
    - So most of you scored xx. Why did you score around this number?
- Why not 10?
- What could be done to improve your satisfaction with work? What is missing from your job?
- Has your job been getting better or worse for you over time? Why?
- What is your dream job?
    - Why is this your dream job?
    - What is stopping you from achieving your dream job? Why haven't you achieved it yet?
    - Do you think you could ever achieve your dream job?
    - What help would you need to achieve your dream job?

5. Understanding of job automation (20 minutes) (120)

- In Cambodia or other countries have you heard about people losing their jobs due to the development of machines?
    - What do you know about this?
    - Has this happened to anyone you know?
    - What types of jobs do you think are likely to be automated in the near future? Why these jobs?
    - Do you think your job could be automated? Why / why not?
- (If yes) Is there anything you could do to stop your job from being automated?
- What would this be?
    - Which jobs do you think are resilient to automation? Why is this?