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Future of Work in Sri Lanka

Shaping technology transitions for
a brighter future

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Future of Work in Sri Lanka: Shaping technology transitions for a brighter future

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Executive Summary

Setting the Stage

The World of Work is undergoing a major transformation. The interaction of several complex drivers — technological advancements, demographic transitions, shifting political cultures, and changing patterns of employment and production, amongst others — are heralding profound, and perhaps, unprecedented changes for the way people work and live. Most scholarly attention and public anxiety has been focused on the impact of the so-called Fourth Industrial Revolution (4IR), which typically refers to a cluster of digitally-driven technologies such as artificial intelligence, intelligent automation, and robotics, among others, in the world of work. While global narratives oscillate between optimism and pessimism, these narratives need to be re-examined in light of the varying socio-economic contexts across the global south. In many countries in the global south, earlier industrial revolutions are still unfolding. Technology trajectories and their impact on the world of work will be shaped by political and social interactions at the local level. There is currently little discussion or evidence of the impact that emerging technologies will have on the future of work in developing countries. This study attempt to fill that gap.

What impact will emerging technologies associated with 4IR have on the future world of work in Sri Lanka? Who will be the winners and losers and what can governments, industry, and citizens do to prepare for the changes that lie ahead? In particular, we focus on three issues: Automation and Job Displacement; Employment Conditions; and Inequities in the Labour Market.

Findings about the likely impact of technology on the world of work have been articulated in the form of ‘propositions’. These propositions represent the expected changes Sri Lanka will see over the next ten to fifteen years based on a review of literature, a policy lab with stakeholders and a qualitative survey.

Automation and Job Displacement

Much of the debate around emerging technologies and automation is centered around expectations of unprecedented job loss. Automation adoption in a particular sector and the consequent impact on labour will depend on a number of factors, ranging from technological feasibility, cost-effectiveness and availability of physical, digital and social infrastructure. The following propositions attempt to understand how these elements engage in the Sri Lankan context, and the subsequent possibility of job displacement.

- *Progressive technology adoption will lead to the greater commercialisation of agriculture and a subsequent reduction in labour needs.* Technology deployment and integration within the agricultural sector will be largely contingent on the extent of commercialisation prospects and integration within global value chains. This is likely to reduce dependency on agricultural labour, without necessarily causing widespread displacement. This is because workers are already moving out of agriculture due to rising environmental challenges and socio-economic vulnerability. However, the potential absence of alternative employment opportunities for rural

labour could impact those dependent on agriculture for employment and disturb seasonal labour trends.

- *The plantation sector will need to automate various stages of the production process in order to cope with growing labour shortages and changing youth aspirations.* Dwindling livelihoods opportunities, along with changing youth aspirations, are leading to a decline in plantation labour. Despite persistent labour shortages, there are challenges to adopting automation technologies in the Sri Lankan context. These include the abundance of small holdings; geographical and climate concerns like topsoil erosion impacting high altitude plantations; and the delicacy of the tea picking process. Developments in these processes could lead to limited displacement, yet this is unlikely to impact overall employment in the sector.
- *Labour shortages in the construction sector are more likely to be overcome by incoming migrant workers rather than technology adoption.* Most advanced construction technologies require a high rate of investment; despite the rapid growth of the sector globally, technology adoption has been slow on the uptake, mainly due to high costs and complexity in implementation. While construction technologies could potentially address the sector's labour shortage in Sri Lanka, low awareness of technological possibilities among the construction industry has slowed the uptake of modern construction methods. The lack of regulation of inward labour migration makes it much easier for construction companies to rely on investment on low-skilled labour by foreign workers, instead of investing in technology.
- *Growth in logistics will lead to increased labour demand, but high automation adoption will eventually lead to displacement.* Logistics is marked as a crucial sector under Sri Lanka's National Export Strategy, highlighting its role in the growth of commerce and trade. Increasing demand and the subsequent expansion of logistics is likely to generate new employment opportunities in the coming five years. However, the adoption of advanced technologies and smart management solutions are likely to displace various middle-skilled occupations, such as supervisory and managerial positions, while also reducing the demand for permanent labour.
- *Technology-led displacement will occur for entry-level and mid-skill jobs in the IT, Business Process Outsourcing (BPO) and financial sectors. Access to emerging specialised jobs will require investment in advanced skills and lifelong learning.* The expansion of Sri Lanka's IT industry, mainly oriented at international markets, is likely to increase demand for high-skilled technical jobs around data analysis and cyber security. Meanwhile, the BPO and financial sectors characterised by backend and mid-level repetitive jobs are likely to face automation-led displacement. Technological adoption by local firms, however, will be influenced by feasibility; the

availability of skilled labour along with requisite digital skills in the population; and the extent of Sri Lanka's integration in the global economy. These rapid changes in technology advancement require sustained efforts in reskilling and upskilling as the chances of job loss and redundancy are very high.

- *The growth in e-commerce will enable new markets to emerge, but traditional retail jobs will no longer provide opportunity for social mobility for low-skilled youth.* A large portion of Sri Lanka's youth could bear the burden of job losses in the retail industry, particularly those moving out of agriculture and plantations, for whom retail is an easy stepping stone into formal work. On the contrary, a rise in e-commerce is expected to match this development through technological feasibility and low investments. This will generate labour demand for various positions, particularly in the lower-skilled levels, though it is likely to be precarious and temporary as these jobs are also at risk of automation.
- *Technology adoption will lead to job polarisation in the manufacturing sector.* The deployment of emerging technologies, like industrial automation and artificial intelligence, is at a nascent stage in Sri Lanka's manufacturing sector. But increased labour productivity through automation could reduce dependence on permanent labour in the long run. High-skilled jobs that require complex cognitive tasks that are not frequently repeated are unlikely to get automated and automation of manual jobs that require hand-eye coordination and can be quickly taught does not make economic sense. However, middle-skilled routine jobs that can only be completed with training but do not require critical thinking are most likely to get automated in the coming decade. Niche capital and technology-intensive industries, such as food processing, will continue to see a high level of automation of physical processes. However, middle-skill level jobs across organised manufacturing will be majorly affected due to digitisation and back-end automation.
- *The public sector will be shielded from technological disruption, despite high automation potential.* Sri Lanka's public sector is expansive, both in terms of size and influence. In the absence of targeted efforts, it is likely not to be significantly impacted by technology disruption. In terms of e-governance strategies, success will depend on proper educational and training efforts, along with changing popular notions and perceptions around technology and bureaucracy, within and outside the government.

Employment Conditions

The spread of emerging technologies is changing organisational structures and employee management practices. With full-time and permanent employment being replaced by part time and contractual work, there are less associated benefits and security for employees. In Sri Lanka, the divergence from standard forms of employment is reflected in increasing demand for flexible work, often both from employers and employees, and the platformisation of services, especially within the manufacturing sector. Much of this will work to dilute established employment standards, as the nature and culture of work is constantly altered. Changing and

diverging youth aspirations, are also likely to reconfigure the dominant perceptions around suitable work and working conditions.

The four propositions below illustrate the key ways in which emerging technologies are likely to recast employment conditions, particularly looking at the nature of employment; the platformisation of work; work culture and employee management; and collective bargaining mechanisms.

- *Non-standard forms of employment will increase, particularly for low-skilled occupations.* The ‘casualisation’ of work and non-standard forms of work are increasing. With the introduction of new technologies, employers are able to forecast and manage their labour needs in real time, as well as remotely. The impact of this is likely to be felt most acutely by low-skilled work, where both physical and cognitive tasks are repetitive and do not require extensive human intervention.
- *The platformisation of work will increase, rendering irrelevant conventional labour protection mechanisms.* The platformisation of work has far-reaching implications, particularly in terms of restructuring the employer-employee relationship. Though the ‘gig-economy’ offers new job opportunities to part-time and casual workers, it is also likely to reveal new inefficiencies and inequities. There is concern that the platform economy will create new forms of precarious work, eroding worker’s livelihoods and rights in significant ways.
- *Technology adoption for human resource management is likely to rapidly transform work culture.* The implementation of technological solutions — social media, smart co-working spaces, surveillance technologies, to name a few — for workforce and human resource management are impacting work cultures in different ways. For instance, remote monitoring technologies give companies the power to track their employees in real-time from any location. Responses to such applications goes both ways — as big companies like Amazon are criticised for strict monitoring technologies, other doors are opened for people, like some women, who are only able to work remotely and now have the option of doing so without going into the office.
- *Collective bargaining and traditional forms of unionisation are likely to weaken with the platformisation and proliferation of non-standard work.* Modern work environments are affecting collective bargaining practices, especially unionisation. The rise of non-standard forms of employment and outsourcing, specifically in the IT & BPO sectors, is making collective organising on the job significantly harder. Further, in the absence of shared working spaces and employers, remote platform workers face multiple difficulties in connecting with other workers within the digital, freelancing ecosystem. In this sense, digital and social media platforms may also be useful for new forms of remote collectivisation.

Labour Market Inequities

Labour welfare and access to technology gains is going to be shaped by underlying socio-economic conditions and inequities. While technological disruptions and digitisation can work towards levelling the playing field, the existing social inequities are likely to get reproduced or even further entrenched with the spread of new technologies. Three propositions present how socio-cultural factors, regional, political and economic differences shape the distribution of technology gains.

- *Women are likely to be able to avail new economic opportunities but the gendered division of labour will persist.* Though the platform economy allows women to circumvent both mobility and cultural barriers, while also enabling them to move towards equal pay opportunities, more nuanced barriers in terms of work access and engagement will remain unaddressed by emerging technologies. Employment conditions in the digital economy may not provide the same social and labour protections to its employees, many of whom are women who will continue to carry the burden of domestic work, the productive value of which is not recognized.
- *Current regional disparities are likely to be reproduced, entrenched and even exacerbated with technological adoption.* The disproportionate focus of investment in education, infrastructure and economy in urban areas, especially Colombo, combined with protracted civil conflict and marginalisation in the Northern and Eastern provinces have created stark regional disparities in language proficiency, digital skills, and access to decent jobs and employment. These conditions are likely to shape the distribution of technology gains across the country. Existing regional disparities will get reproduced due to unequal access to the digital economy.
- *Skilling gaps and language impediment will pose a challenge for workers in accessing decent work and technology gains.* Current gaps in education and skilling are one of the key challenges for Sri Lanka, as it prepares for the future world of work. A large section of Sri Lankan youth has not completed higher-education, nor skill training— soft skills, digital literacy, and English literacy. This will restrict their access to high-skill jobs that match their aspirations. Instead, youth, both educated and not, are at a standstill — equally unwilling to settle for low-skilled, manual jobs even as they are unqualified for the private sectors' quickly evolving work landscape.

Way Forward

Decisive policy making and action is needed to confront a future where technology may not lead to progress and development for all. Therefore, intervention is needed to shape the Future of Work so that it may be equitable and inclusive. Our study proposes a way forward through three Bright Spots and four Policy Portfolios. Bright spots are sectors that are not easily automable or those in which technological innovation can open new avenues for job creation. Policy Portfolios represent a menu of strategies which can enable decent work.

BRIGHT SPOTS

- **The care economy could provide decent work opportunities, and is likely to be less vulnerable to automation.**

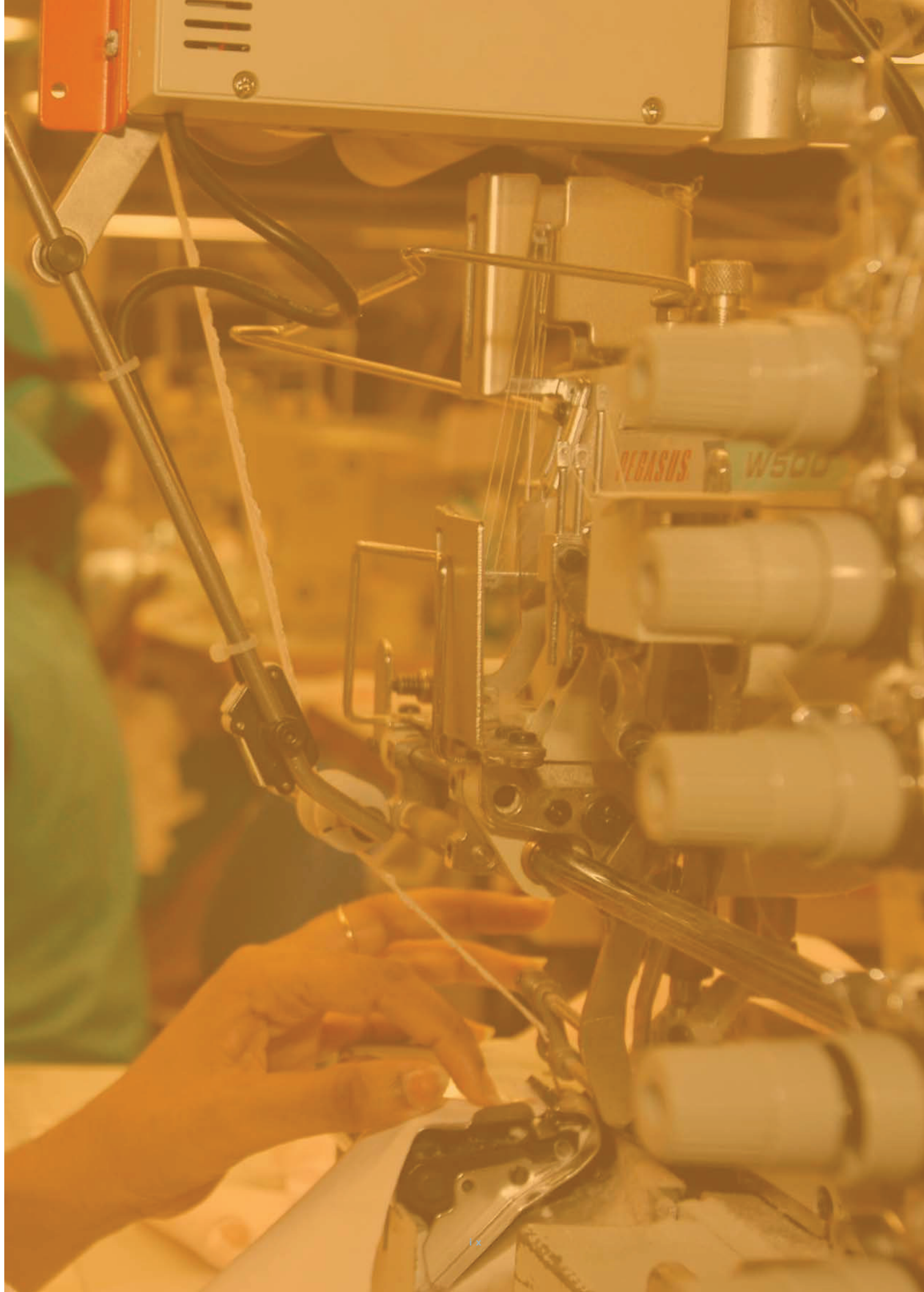
Service jobs that require affective labour, specifically in medical, geriatric and childcare industries, are unlikely to be entirely automated. Any labour involving a personal and emotional connection between the service provider and the receiver will be highly valued in the future. This is particularly for Sri Lanka in the context of a large aging population.

- **Demand for sustainable products and services could generate new employment opportunities.**

Consumer awareness is driving a demand for more sustainable products and services. The strongest potential for sustainability-led opportunities lies in agriculture, renewable energy, waste management and tourism. The move towards sustainable employment opportunities could also open up avenues for women to participate in the workforce.

- **Employment in tourism is likely to grow, driven by the access of individual service providers to digital platforms.**

Tourism-led self-employment through digital platforms is integral as it is likely to create direct and indirect employment in allied industries such as housing, transport, restaurants, etc. While offering dispersed opportunities for work across Sri Lanka, digital platforms are playing a crucial role in decentralising access to work in the tourism sector by enabling small-scale and informal establishments outside the formal hotel industry.



Policy portfolios for decent work: Strategies for further research and exploration

1 Education and Skilling

- a. Promote digital skilling programs, and strengthen foundational skills.
- b. Foster education and skilling programs to address regional gaps.
- c. Focus efforts into skilling for jobs in Data Science and Cyber Security.

2 Technology and Innovation

- a. Implement a Data Governance plan.
- b. Support Mission-Oriented Innovation.
- c. Encourage Technology Adoption and Spurring Entrepreneurship.

3 Labour Protection

- a. Revise Labour Protection plans.
- b. Regulate the platform economy.

4 Redistribution

- a. Strengthen social security provisions.
- b. Redistribute Technology Gains.

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Abbreviations

4IR	: Fourth Industrial Revolution	SLBFE	: Sri Lanka Bureau of Foreign Employment
AI	: Artificial Intelligence	SLEF	: Sri Lanka Ecotourism Foundation
AICTE	: All India Council for Technical Education	SLIATE	: Sri Lanka Institute of Advanced Technical Education
APTA	: Asia Pacific Trade Agreement	SLTDA	: Sri Lanka Tourism Development Authority
B2C	: Business to Consumer	SME	: Small and Medium Enterprises
BPM	: Business Process Management	STEM	: Science, Technology, Engineering and Mathematics,
BPO	: Business Process Outsourcing	UNDAF	: United Nations Development Assistance Framework
CIC	: CIC Agribusiness	UNICEF	: United Nations International Children's Emergency Fund
DJI	: SZ DJI Technology Co., Ltd.		
EFL	: Expo Freight Limited		
EPF	: Employee Provident Fund		
EPZ	: Export Processing Zones		
FDI	: Foreign Direct Investment		
FEASC	: Finite Element Analysis Simulation Centre		
GCE	: General Certificate of Education		
GDP	: Gross Domestic Product		
GDPR	: EU's General Data Protection Regulations		
HR	: Human Resources		
HRMS	: Human Resource Management Systems		
ICT	: Information and Communications Technology		
ICTA	: Sri Lanka's Information and Communication Technology Agency		
ISFTA	: India - Sri Lanka Free Trade Agreement		
LEARN	: Lanka Education and Research Network		
LFPR	: Labour Force Participation Rate		
LMIC	: Low-Middle Income Countries		
LSEG	: London Stock Exchange Group		
MCC	: Multi-Country Consolidation		
ML	: Machine Learning		
MMC	: Modern Methods of Construction		
MoU	: Memorandum of Understanding		
NKN	: National Knowledge Network		
PSFTA	: Pakistan-Sri Lanka Free Trade Agreement		
SAFTA	: South Asian Free Trade Area		
SLASSCOM	: Sri Lanka Association for Software and Services Companies		

Chapter 1 / Introduction

1.1/

Setting the Stage

—

The World of Work is undergoing major transformations brought about by the interaction of several complex drivers including technological advancements; demographic transitions; shifting political cultures; and changing patterns of employment and production. However, much public attention and anxiety has been focused on the impact of a cluster of digitally-driven technologies — artificial intelligence, intelligent automation, robotics and Internet of Things, among others — often collectively known as the Fourth Industrial Revolution or 4IR. This widespread technological transformation has the potential to replace and augment human labour, and thus could herald profound, complex and perhaps unprecedented transformations in the World of Work.

Numerous books, articles, and conferences cite the likely impacts of the 4IR on society and work. Most accounts posit 4IR as the summit of numerous technological transformations, unfolding in a linear trajectory since the First Industrial Revolution, following a logic that is technologically deterministic i.e. that technological advancement is as inevitable as it is necessary for development. The celebration of “work, progress and prosperity in a time of brilliant technologies” leads this discussion¹, with stakeholders like the founder of the World Economic Forum Klaus Schwab even stating that this industrial revolution “will be unlike any other in human history.”² On the other side of the spectrum are the dystopic, yet equally amplified trajectories of technology, such as Martin Ford’s *The Rise of the Robots*, where he explicates technology as a threat of mass unemployment.³ The dangers of super artificial intelligence, pose the ‘challenge of control’ in a world overrun by the advancement of technology.⁴

Many analysts warn that advances in both robotics and artificial intelligence over the next few decades could lead to significant job losses or job polarisation, giving way to an increase in inequality as seen in widening income and wealth disparities.⁵ A recent report by Merrill Lynch projected a 35 percent estimation of worker displacement in the United Kingdom, as well as a 47 percent estimation of the workforce in the United States being at risk of technological displacement over the next 20 years.⁶ Though, according to the World Bank, emerging and developing economies and countries will be at the highest risk, with 69 percent of jobs subject to displacement in India; 72 percent in Thailand; 77 percent in China; and 85 percent in Ethiopia.⁷ Conversely, many stakeholders propose that inequitable distribution of technology gains can be counterbalanced by the generation of new job opportunities and subsequent efforts of re-skilling mass populations to integrate into an economy transformed by 4IR.⁸

While long-term productivity gains in a 4IR future are plausible, previous industrial revolutions are still incomplete and marked by huge inequalities— especially in many developing countries. A large proportion of the labour force in low-middle income countries (LMIC) are low-skilled labourers in the informal or unorganised

sector, already experiencing low wages, weak forms of social protection, and precarious employment conditions.⁹ Technological advances will undoubtedly create new productivity and jobs, but those who lose their jobs in the transitions will be least equipped to benefit from new opportunities. Current skills will be inadequate for new jobs and newly acquired skills will rapidly be rendered obsolete. There is a real risk that 4IR trajectories will reproduce and even amplify socio-economic inequities due to differences in access to new technologies, as well as capacities between countries; urban or rural areas; genders; and generations.¹⁰

Global narratives on the march of 4IR will need to be re-examined in the context of emerging and developing economies, where there is a paucity of research and evidence. While the disruptive impact of technology on the future of work will be experienced globally, the exact nature of the impact will need to be mediated through local, political, legal and socio-economic structures.¹¹ To successfully formulate propositions and identify trajectories in the Sri Lankan context, a deeper investigation is required into the country's unique socio-economic and cultural context and challenges, such as low labour force participation of women, high degrees of informality, and wide gaps in skilling and education outcomes for the youth.

Decisive action will be required to provide 'Decent Work'¹² to "create a brighter future and deliver economic security, equal opportunity and social justice – and ultimately reinforce the fabric of our societies".¹³ The ILO defines 'decent work' as "opportunities for work that are productive and which deliver a fair income, security in the workplace and social protection for families. It comes with better prospects for personal development and social integration, freedom for people to express their concerns, organise and participate in decisions that affect their lives and equality of opportunity and treatment for all women and men."¹⁴

This study examines some of the major drivers that are likely to shape the Future of Work in the Sri Lankan context. It focuses on key features of automation and job displacement that could take place in the future and how these changes are likely to impact employment conditions (with an emphasis on labour welfare and social protection) and labour inequities. In other words, it asks: What are the prospects of providing decent work in Sri Lanka, as it copes with the disruptive effects of technological change and seizes new opportunities?

1.2 /

Methodology

There is inadequate research on the impact of emerging technologies on the World of Work in the Sri Lankan context. Essentially, 4IR is still developing and thus cannot be posited as a typical case study. Foresight and anticipatory knowledge are therefore key to understanding the Future of Work in Sri Lanka.

The method of qualitative enquiry adopted in this study involved two steps. First, a policy lab was held, bringing together a Technology Foresight Group¹⁵ comprised of multiple stakeholders across government, industry, civil society, and academia. The lab helped map the key actors, institutions, and themes, as well identify sectors, enterprises and industries linked to the three themes in question: Automation and Job Displacement; Employment Conditions; and Labour Market Inequities.

Next, around forty semi-structured qualitative interviews (40) with key informants were conducted. The interviewees included various stakeholder groups including workers and unions; employers in startups and multinational companies; important industry bodies; policy makers and relevant government workers, alike; and journalists and academics involved in the issues of labour and employment. (*See Annex 1*). Interview questions were positioned to assess how technology transforms and disrupts critical aspects of work, from indicators of net displacement to working conditions, and gender.

Subsequently, findings about the likely impact of technology on labour have been articulated in the form of ‘propositions’. These propositions

represent the expected changes Sri Lanka will see over the next ten to fifteen years. Due to the limited data on current labour trends, as well as the complex interplay of factors and drivers at hand, a more long-term analysis is limited. With this in mind, propositions are not to be considered predictions, rather, they are reflective of plausibility, likelihood and expected scenarios.¹⁶

This report is structured as five chapters, beginning with Chapter 1 which introduces the premise of 4IR technologies; methods of enquiry; and context of both the structure of labour markets and technological developments in Sri Lanka. Chapter 2, 3, 4 follow with propositions related to Automation and Displacement, Employment Conditions, and Labour Market Inequities, respectively. Finally, Chapter 5 presents Bright Spots — stable areas of work where human value will continue to be important despite technological transformation — as well as Policy Portfolios as coping strategies in the face of emerging 4IR technologies and their impact in the Sri Lankan context.

1.3 /

Trends

Sri Lanka’s structural transformation process, from an agriculture-based economy to an industry and service-led one, has been shaped by strong waves of liberalisation policies since 1977. This process has been taking place in conditions of an internal war that lasted 26 years. The earliest market reform efforts followed a long period of autarkic policies when the predominant source of employment was the public sector.¹⁷ The development of export-oriented industries and foreign direct

¹⁵ Tandem Research has assembled a Technology Foresight Group (TFG) composed of experts from diverse disciplines of work and study. The TFG guides Tandem Research’s deliberations on technology and society in India, to help localise global technology narratives to the Indian content, unpack the social dimensions of technology trajectories, and provide policy recommendations that can steer future technology trajectories in India.

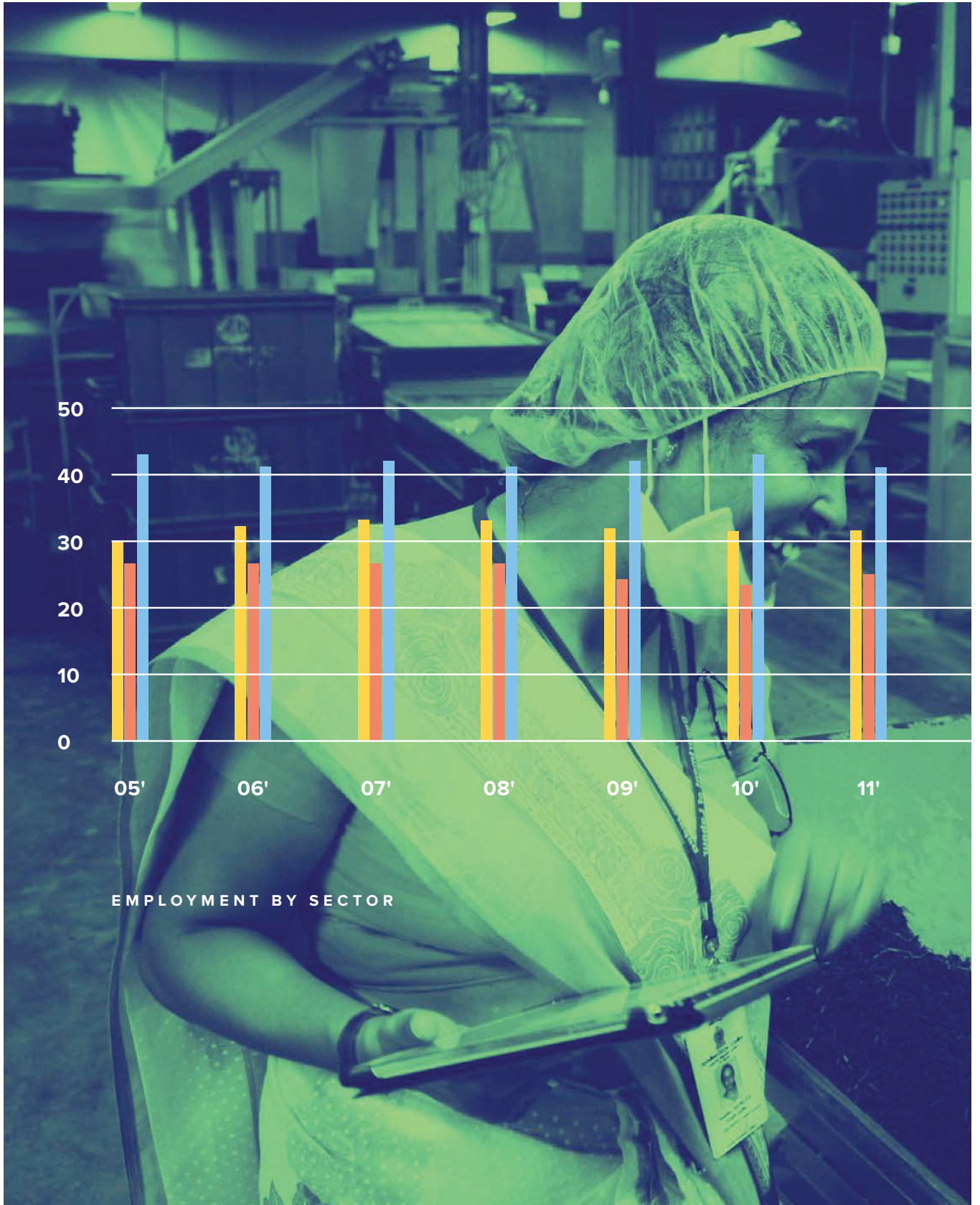
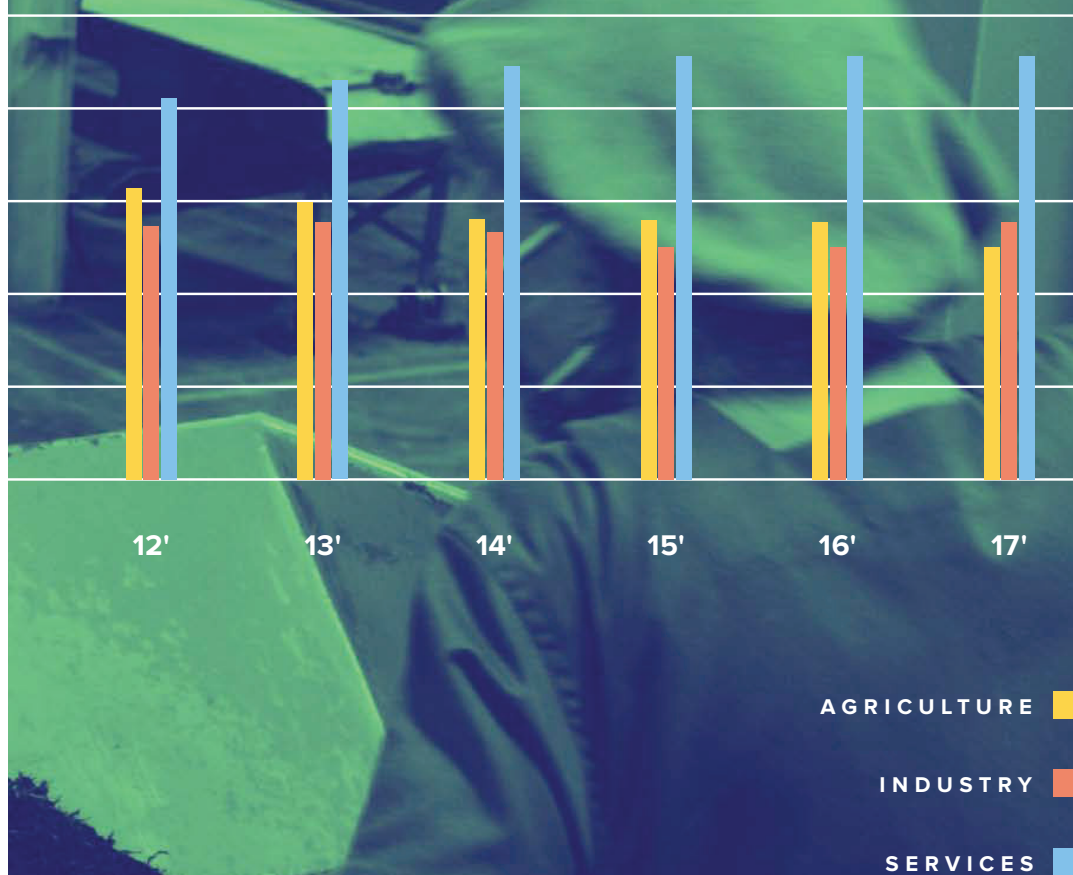


FIGURE 1. EMPLOYMENT BY SECTOR: AGRICULTURE,
INDUSTRY, SERVICES.³⁵³

Employment by Sector



investment (FDI) were critical elements of the countries early liberalisation efforts. Not only did private sector employment increase against the decline in public sector employment, over half the employment growth in the 1980's and 1990's was generated by export-oriented manufacturing, primarily ready-made garments. The contribution of manufacturing to GDP also increased from 10% in the 1970s to 20% by 2000.¹⁸ Employment in agriculture continues to decline, and yet it is disproportionately high at 26.1%, while the sector's contribution to GDP has fallen to 7.7% as of 2017. (See *Figure 1*). The highest share of employment is in the services sector at 45.5%, while employment in industry is 28%.¹⁹

With the end of the war in 2009, the country returned to a public sector-driven growth model; led by state investment in infrastructure, FDI plummeted during the war period until 2017 to less than 2%.²⁰ Public sector employment also increased, accounting for 14.4 percent of the labour force in 2017. The change in political regime in 2015 has brought about renewed interest in liberalisation policies, focusing on Sri Lanka's integration into the global economy. Sri Lanka is already engaged in two bilateral agreements, India- Sri Lanka Free Trade Agreement (ISFTA) and the Pakistan-Sri Lanka Free Trade Agreement (PSFTA) and two regional agreements, Asia Pacific Trade Agreement (APTA) and South Asia Free Trade Agreement (SAFTA). While the country has enjoyed reasonable economic growth post the conflict period, this has not translated into proportional job creation, as reflected in the UNDAF 2015 state analysis.²¹

The role technological adoption plays in facilitating the conditions for globalisation is critical, with technology serving as a tool to overcome geographic boundaries and facilitating economies of scale.²² For instance, the setting up of Sri Lanka's BPO industry was largely enabled with the combination of high educational qualifications and the deployment

of Information and Communication Technologies (LIRNEAsia, 2006).²³ The tussle between open economy and protectionist policies are likely to shape the nature and extent of technological penetration in Sri Lanka.

The Sri Lankan labour market is facing a conundrum, with artificial labour shortages. The Labour Demand Survey revealed that there were over 490,000 vacancies in the private sector — both for informal and formal jobs — in the first half of 2017 — even though there are more than 360,000 unemployed people (4.4% of the labour force) and an average of 150,000 unskilled workers joining the workforce each year.²⁴ The public sector faces immense political pressure to play a critical role in creating job opportunities, particularly for university graduate employment, implicating the absence of decent work opportunities.

As per the SLBFE annual survey, approximately 1.7 million Sri Lankans are working abroad, largely concentrated in the Middle East. While workers departing for foreign employment peaked in 2014 — at over 300,000 people leaving the country, this trend is declining, with numbers down to 242,930 as of 2016.²⁵ However, the departure of skilled workers is increasing, with growing demand from advanced economies such as Australia.

Sri Lanka's labour crunch is likely to get accentuated with the country's changing demographic structure. Sri Lanka is one of the fastest aging countries in the world²⁶ — predictions indicate that the mean age of the worker will continue to increase well into 2041. By 2030, over 20% of the population will be above the age of 60, and population aging will lead to a slow-down in the labour force. By 2025, those aged 40-44 will form the bulk of the population and the elderly dependency ratio is expected to exceed that of the youth, enhancing the intergenerational burden of care.²⁷

The stress of unpaid care work is already a critical issue for women. Women's persistently low labour force participation rate, at less than 37%, further feeds into Sri Lanka's artificial labour shortages. Furthermore, women in the labour force face a range of issues in accessing decent work opportunities.²⁸ Informality persists in Sri Lanka at more than 67% and is particularly so in the agricultural sector at 89%, with a high share of women workers, particularly engaged as unpaid family labour.²⁹ Despite high public sector employment for educated women, they continue to have extremely low political representation, with only 5.8% of parliamentarians being women.³⁰

Sri Lanka's labour constraints are also a symptom of severe skill gaps. Despite high literacy (92%) and enrollment (97%) rates, the country's educational and vocational systems face multiple challenges.³¹ As highlighted by labour shortages for high-skilled professions — in the IT sector, health care and so forth — the link between education and employment is broken. Youth unemployment was at 18.5% in 2017 – over four times the national unemployment rate.³² The unemployment rate is significantly higher for graduates at more than 30%.³³ This is due to a number of factors – graduates often don't have the skills that employers are looking for; mismatch between types of jobs available and youth aspirations; lack of career counseling; and oversaturation of the public sector.

Even within formal education, 18 percent of students drop out before completing the ordinary level examination (GCE; O/Level) as per UNICEF.³⁴ Various disadvantaged regions such as estates, urban slums, and rural areas have a significantly higher dropout rate at more than 50%.³⁵ Demand for technology-related skills is steadily rising, yet there is a skewed distribution of students between humanities and science and technology courses. Overall, digital and computer literacy rates are still relatively low. Digital literacy fared incrementally better at 33.8% as opposed to the 27.6% computer literacy rate; in both categories,

highest levels at over 60% were noted by younger age cohorts (15-19; 20-24). Language literacy has a strong correlation with computer literacy — 72.5% of those with English literacy were computer literate as compared to 33.4% of those with Sinhala literacy and 27.2% of those with Tamil literacy.³⁶ English literacy in Sri Lanka is also low at less than 35%.

Overall, Sri Lanka's human development indicators, assessing health, educational and living condition, are significantly above the South Asian region, with notable improvements in all areas in the last two decades. Working poverty has reduced with a consistent increase in real wages between the period of 2006 and 2014, and a per capita GDP of over US\$ 4000 as of 2017, positioning the country at a lower-middle income status. Sri Lanka observed a Human Development Index score of 0.77 in 2017, having increased by over 23% since 1990 — much higher than the South Asian average of 0.638 and also higher than the 0.757 average of countries in the high human development group.³⁷

Despite remarkable reductions in poverty, inequality persists with a human inequality coefficient 13.6%.³⁸ Over 67% of the income share is held by the top 40%, while the lowest quintile income share was 4.8% in 2016.³⁹ Consumption inequality actually rose between 2009 and 2015.⁴⁰

These inequalities are deeply intertwined with Sri Lanka's regional disparities. The country's economic growth has been concentrated in urban areas, where the urban sector with 17% of the country's households experienced a 48% increase in mean household income, as opposed to the 23% increase in the rural sector with 79% of Sri Lankan households, and a 24% increase in estate sector representing 4% of households. Yet, with increasing internal migration⁴¹, urban poverty is a growing phenomenon, with 40% of Sri Lanka's poorest population living in cities, dependent on the urban sector for employment opportunities.⁴²

Moreover, while national poverty has fallen to 7%, certain districts such as Monaragala in the Uva province and Mullaitivu in the northeast have actually noted an increase in poverty by around 20%.⁴³ Poverty rates are also higher in the estate sector as compared to urban and rural areas.⁴⁴

Digital access in Sri Lanka is largely contingent on mobile phones, with rapidly increasing mobile penetration, over 135% as of 2017.⁴⁵ Mobile broadband connections have also risen from 8% in 2012 to 21% in 2017, with industry leader Dialog Axiata testing out 5G connections in Colombo.⁴⁶ Mobile phones dominate avenues of digital access, with fixed broadband connections remaining low at 4.7%. So far, business activity has relied heavily on fixed broadband connections for its speed and efficiency, but the success of 5G networks is likely to change that.⁴⁷ While internet penetration in Sri Lanka is currently low at 30%, the evolving nature of digital technologies can alter access in the coming decade. However, current access patterns are also likely to determine future digital engagement trends.

Sri Lanka is ranked as the second highest on the Global Climate Risk Index.⁵⁰ Climate change is likely to have a tremendous impact on employment in terms of job losses, business interruptions, impact on business assets, impact on working conditions, impact on labour productivity, and forced short and long term migration. The groups that will be most in peril due to these changes are the working poor, those in the informal economy, seasonal and casual workers, self-employed workers, and micro and small sized enterprises.⁵¹

Technological progress, fueled by a culture of entrepreneurship and globalisation, are often seen to offer a movement away from Sri Lanka's long civil war and political troubles

which have engulfed the country and its economy for over four decades. The focus on economic development through innovation and digital technologies, both by state and private actors, highlights an alternative narrative for Sri Lanka, to the one of rising national debt, social unrest and political volatility.

1.4 /

4IR in Sri Lanka

— The adoption of 4IR technologies will not be contingent on technological feasibility alone. Rather, technological adoption will depend on a complex interplay of factors including labour market dynamics and the relative cost of labour; relevant education and skilling to operate and leverage 4IR; legal frameworks for innovation and labour protection; the availability of supporting infrastructure; and social and cultural norms that shape attitudes towards technological change and innovation.⁵²

Sri Lanka has taken a few steps in providing infrastructure of 4IR in the last two decades. For example, following a telecommunication sector liberalisation in the late 1990s, Sri Lanka has seen a rapid improvement in its Information Communication Technology (ICT) infrastructure. The developments in ICT have created a firm foundation for entrepreneurship in the country, particularly in the digital sector. The country became the first in South Asia to launch GSM mobile technology, 3G and 4G. It is connected to the SE-ME-WE-4 submarine cable for the region, and boasts an island wide mobile data connectivity that rivals many in Southeast Asia. A World Bank-supported national project drove the country's 'e-Sri Lanka' initiative, which created the apex national

41 Almost 20% of the population- see MAPS Approach Supporting SDG Implementation in Sri Lanka. (2018, January). Government of Sri Lanka & UN Country Team in Sri Lanka.)

45 Number of mobile cellular subscriptions per 100 inhabitants in Sri Lanka from 2000 to 2017. (2018, September). Statista. Retrieved from [<https://www.statista.com/statistics/510604/mobile-cellular-subscriptions-per-100-inhabitants-in-sri-lanka/>]

agency responsible for ICT – the ICT Agency (ICTA); implemented a host of e-government efforts; and established hundreds of rural tele-centers across the country.

Alongside these, the demand for technology related skills are steadily rising. There has been a proliferation of private colleges and institutes offering IT-related degrees in partnership with international universities. Consequently, Sri Lanka has become recognized regionally and globally as a hub of niche digital services activity, primarily in software development and IT-enabled services like Finance and Accounting. Critical steps have been made to support current labour market skilling needs, such as the formation of the Sri Lanka Institute of Advanced Technical Education (SLIATE) in 1995, focusing on diplomas in accountancy, English and engineering. There were over 12,000 students enrolled in the 12 Advanced Technical Institutions in 2014.

Likewise, the Sri Lanka Association of Software and Services Companies (SLASSCOM) — the apex industry body for the ICT industry — has expanded their focus to cover digital startups and to support the digital entrepreneurship ecosystem, including launching a ‘1,000 Startups’ initiative. An international network stemming from Sri Lanka’s large population of diaspora returnees has provided a solid foundation for international partnerships for startup programs and pitch competitions. Some of the well-known programs providing courses, seed funding, and mentorship are Venture Frontier, Venture Engine VE, Spiralation, MIT Global Startup Labs, and Xeleration. Incubators, accelerators, and co-working spaces have also popped up around Colombo, with the most prominent being Hatch, StartupXFoundry, Likuid Spaces, and Igniter Space. Many startup founders in Colombo have described it as an ideal test-bed for new ventures and ideas — a relatively small yet conducive market allows for the easier adoption of new products and

services, while also acquiring feedback for scalability.⁵³

A key challenge, however, is that the startup ecosystem is mostly limited to the Western Province of the country, and in particular, Colombo.⁵⁴ There are some efforts to diversify this – for instance, the IT Sector Strategy of the National Export Strategy envisages the establishment of new startup hubs in at least three new cities in provinces outside of the Western Province. There is also a notable gender gap in entrepreneurial intention.⁵⁵ This may partly explain why a majority of startups in Sri Lanka are headed by men.⁵⁶ Supportive environments and perceptions of self-efficacy also factor into entrepreneurial intention.⁵⁷ Supporting financial inclusion of women, reducing gender-based discrimination in hiring and in the workplace and empowering women to have economic agency will be critical to enable their participation in the startups.

The public sector’s role in shaping technological trajectories is going to be critical. The government’s digital drives across multiple sectors can also contribute to increased digital access and usage. For instance, Sri Lanka’s digital society plan supported by a MoU with India in the areas of IT and Electronics, along with a other shared initiatives such as a partnership linking India’s National Knowledge Network (NKN) and the Lanka Education and Research Network (LEARN), is strategically geared to heightening digital adoption for the skilled labour force.⁵⁸ The government also has an e-governance policy in partnership for digital transformation with Microsoft, which aims to enhance capacity and productivity in the public sector, including software procurement for citizen services and the implementation of ‘Smart-Classrooms’ with a focus to equip students digitally and technically.⁵⁹

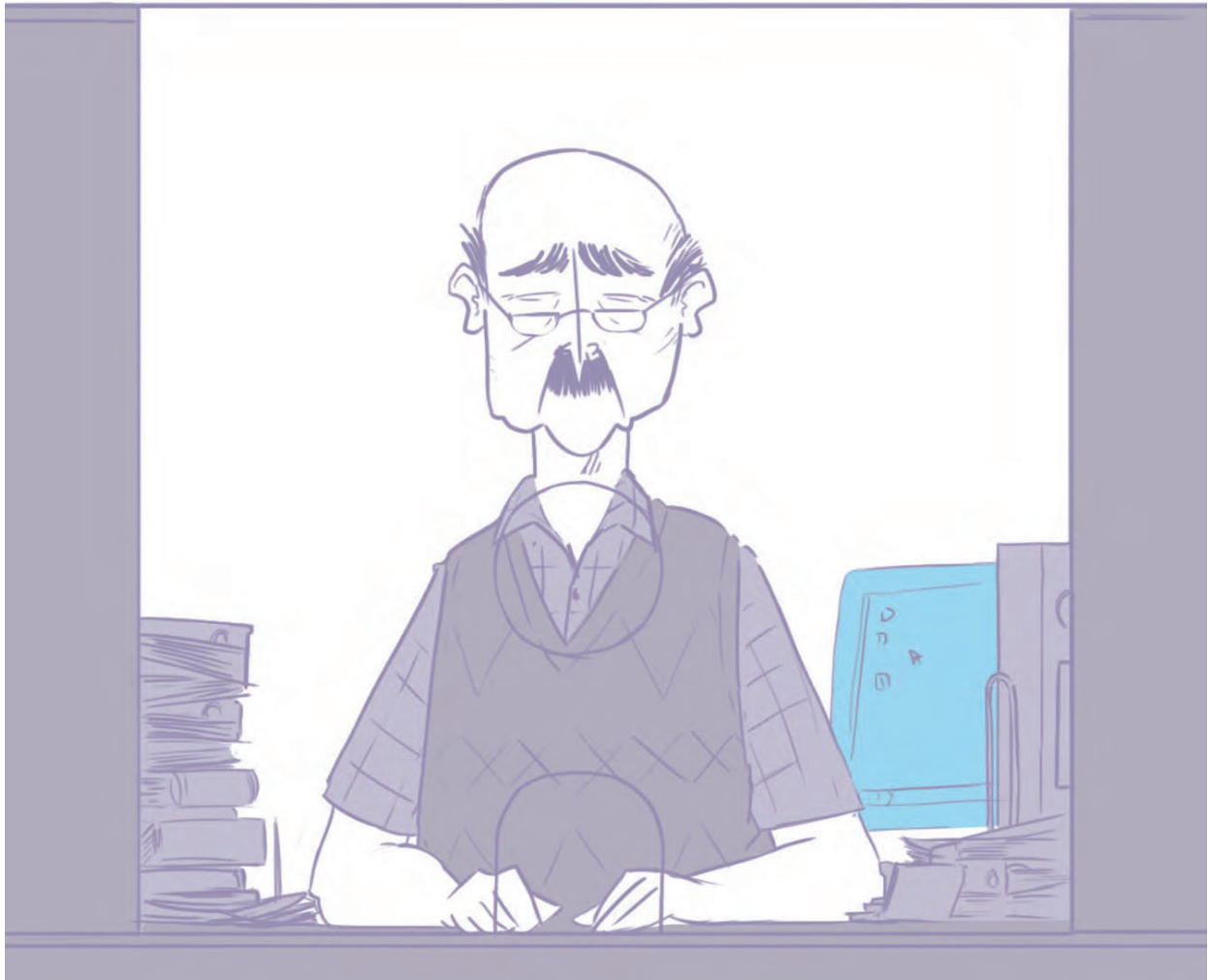
Big data is one of the underlying forces that will define and determine the implementation

of 4IR technologies, providing information about patterns, trends, and associations on a massive scale that are relevant to consumers, citizens, and large groups.⁶⁰ Large scale digitisation and software automation will also facilitate the collection of big data, giving virtual data immense value. Thus, concerns about data privacy will have to be addressed.⁶¹ Data privacy norms and regulations will be needed to ensure proper handling of personal data – if data can be legally collected and stored; whether or how data can be shared with third parties and what constitutes meaningful consent in the collection and use of personal data. Reportedly, Sri Lanka's privacy bill has been pending in parliament for years, rendering Sri Lankan citizens, workers and consumers vulnerable. With the implementation of EU's General Data Protection Regulations (GDPR), compliance is critical for all firms and industries dealing with data related to EU citizens. This will have direct and indirect ramifications for export-oriented manufacturing units, IT firms and startups serving or partnering with EU clients, along with the tourism industry, port activities and so forth.⁶²

Strategic automation and digitisation have the potential to benefit the Sri Lankan economy and reduce the burden of an aging workforce. However, the island economy faces various institutional obstacles which need to be addressed to facilitate technological adoption—in addition to the absence of a data protection and privacy framework, access to online payment gateways is restricted. Specifically, the limitations international digital payment applications like PayPal is obstructing trade and employment activities for startups and the platform economy.⁶³ Along the same lines, predictive data analysis and smart solutions through applications of AI and ML require large quantities of quality data to process, analyse and learn from. The absence of a critical mass of data relevant to Sri Lanka — including worker, consumer and geographic data — is likely to hinder smart solutions and applications for local and domestic markets.

Chapter 2 / Automation and Job Displacement

Much of the debate around automation and emerging technologies is centered around expectations of unprecedented job losses. For instance, the World Economic Forum states that by 2020, automation will lead to the creation of two million jobs, and the destruction of 7,100,000 jobs. Going further, by 2030, Thomas Frey predicts a job loss of two billion due to automation.⁶⁴ Automation can occur at increased speed, scale and quality— from augmenting or mimicking human actions to augmenting or mimicking human intelligence.⁶⁵ These can thus be understood as “manual automation” and “cognitive automation”, including industrial automation, numerically-controlled machines, industrial robots, computer-aided manufacturing, and flexible manufacturing systems. The level of adoption of automation in a particular sector and the consequent impact on labour depends on a number of factors, ranging from technological feasibility, cost effectiveness and availability of physical, digital and social infrastructure. These propositions attempt to understand how these elements engage in the Sri Lankan context, and the subsequent possibility of job displacement.



Nimal Lakmal is a 50 year old man living in rural Sri Lanka. For the last 20 years, he has been working as a bank teller in one of the two banks within his village, which has now grown in population and infrastructure to resemble a small town.

Throughout the years, Nimal has witnessed his old colleagues leaving the bank, being replaced by younger applicants. In addition to new faces, he has also seen the rise of new technologies within the banking system — from desktops with upgraded banking softwares to money-counting machines.

Though they make his job easier, Nimal is concerned that the increasing level of automation might leave him without a job soon. He realizes the younger generation is more prepared to facilitate such technological transformation, whereas his learning curve is a bit steeper.

2.1/

Progressive technology adoption will lead to the greater commercialisation of agriculture and a reduction in labour needs.

Urbanisation⁶⁶, rising environmental stress along with economic growth led by structural, technological shifts away from agriculture, has contributed to the decline of agriculture output and labour in Sri Lanka. A combination of such factors, along with changing demographic and consumption patterns, are also shaping a shift from subsistence farming⁶⁷ to the commercialisation of agriculture.⁶⁸

While the share of agriculture to GDP was over 40% in the 1950s, it has fallen drastically to 7.1% in 2017. Yet, the sector remains a large employer engaging over 24% of the workforce, with seasonal fluctuations mainly concentrated in rural areas. Over 35% of Sri Lanka's land is under cultivation, but output is comparatively low due to declining productivity. Sri Lanka's vulnerability to climate fluctuations has exacerbated these conditions and is likely to contribute to labour withdrawals.⁶⁹ This was seen in 2016 when the sector experienced negative growth of 4.2% due to the combination of severe drought and heavy rains with flooding.⁷⁰

Current agricultural technologies can be divided into two main categories: one geared towards cultivation and those geared towards disseminating produce or the market. Modern cultivation technologies refer to the mechanization (rather than full automation) of labour-intensive tasks such as harvesting,

watering, and seeding with agricultural robots.⁷¹ Efforts to facilitate “precision farming” which include drones and robotics, big data, smart equipment and sensors, and farm management software are also underway with the intent to gather discrete pieces of data about agricultural land, climate and crop health, allowing for real time assessments. Investment in agritech startups⁷² has seen an explosive increase over the last four years, from a \$0.9 billion investment in 2013 to a \$4.6 billion investment in 2015; this is largely concentrated in developed economies.⁷³ Relatively lower-cost technologies, such as sensor technology that are used in precision agriculture, providing data that helps farmers monitor and optimise crops, as well as adapt to changing environmental factors, are appearing in the markets for developing economies, as well.

There are various challenges to the adoption of cultivation technologies in Sri Lanka. Non-plantation sector agriculture is mainly geared towards the domestic food sector and dominated by paddy cultivation followed by the commercial production of vegetables and fruits. Rice production provides seasonal employment to almost half the rural labour force. Moreover, the sector is characterised by a high share of subsistence farming, largely engaging women labourers in small farms with the average size of 0.69 hectares (ha). Over 90% of households operate on less than 2 ha of land and 70% on less than 1ha. Furthermore, the bulk of agricultural labour is informal — over 85% as of 2017. The prevalence of poverty in the agricultural sector, aggravated by low technological awareness, poorly structured government policies and the persistence of subsistence farming is likely to prevent

⁶⁶ Sri Lanka has seen an increase in rural to urban migration since the open economic policies of 1977. A common occurrence in developing economies, this kind of migration is linked to improving economic status - both for consumptive purposes and as an investment. (Ranathunga, S. P. B. (2011, August 25). Impact of rural to urban labour migration and the remittances on sending household welfare: a Sri Lankan case study. Munich Personal RepEC Archive. Retrieved from [https://mpra.ub.uni-muenchen.de/35943/1/Mpra_paper_35943.pdf]) Such migration has a significant impact on Sri Lanka's economy, which is one that sees a significant contribution from remittances - both internally and from abroad, making it an important factor in understanding the trajectory of employment.

⁶⁷ Focused on self-sufficiency and survival, subsistence farming is less about economic transactions as farmers primarily produce for their own consumption.

small scale farmers from investing in advanced technologies.

To overcome these challenges and participate in the commercialisation process, Sri Lankan conglomerates are developing cultivation and production technologies to varying degrees and setting up contracts with small farmers.⁷⁴ For instance, Hayleys has collaborated with the Sri Lankan Institute of Nanotechnology in order to research nano-scale fungicides and fertilisers. Hayleys also collaborated with DJI in order to develop drones that could be used for manual tasks such as spraying water, and also cognitive tasks such as monitoring in order to provide essential real-time information such as crop status, health, and yields— this indicates development in both manual and cognitive automation.⁷⁵ Another agribusiness firm, CIC, has also deployed ‘precision agriculture’ via drones for disease identification, soil analysis, and targeted application of weedicides and nutrients. By providing farmers with advanced technologies and encouraging the shift from subsistence agriculture to the cultivation of cash crops through buyback farming contracts — where crops are grown by farmers under a buy-back arrangement with companies engaged in trading or processing— corporations are enabling the commercialisation of agriculture.

Digital platforms and technologies are being deployed to directly connect farmers to markets and facilitate the selling of produce— a crucial aspect of commercialisation. The Sri Lankan government’s E-Agri strategy is an attempt to utilise and implement ICT developments in order to improve the agricultural sector. Digital marketplaces for the selling of agricultural produce, like FarmerNet, are on the rise. Though, with low investment costs

and easy adoption, digital platforms are largely contingent on internet access and literacy.

Much of the developments in agritech in Sri Lanka are at an experimental stage. Deployment and integration will be largely contingent on the extent of commercialisation prospects and the involvement with global value chains. This is likely to reduce dependency on agricultural labour, without necessarily causing widespread displacement as workers are already moving out of agriculture due to rising environmental challenges and socio-economic vulnerability. However, the potential absence of alternative employment opportunities for rural labour could impact those dependent on agriculture for employment and disturb seasonal labour trends.

69 While it is too early to ascertain labour trends, particularly due to the seasonal nature of labour in agriculture, the recent drought and floods have adversely output and labour, with employment falling to an all time low of 24.3% in the third quarter of 2017 (3Q17), from an 18-month high of 27.6 percent experienced during the fourth quarter of 2016. (Wettasinghe, C. (2018, January 16). Employment in agriculture sector falls to all-time low. Mirror Business. Retrieved from [www.dailymirror.lk/article/Employment-in-agriculture-sector-falls-to-all-time-low-143982.html])

72 This level of technology adoption in agriculture is not yet seen in developing countries, possibly due to labour availability, as labour shortages are what pushed the need for developing agricultural technologies in countries like the UK and Japan.



“It’s difficult for small farmers to invest in advanced agritech — most often they don’t have the capital or even the awareness. We’re investing and developing agritech, contracting farmers— supplying them with the necessary technologies and knowledge and also buying their products for exports.”

HAYLEY’S AGRITECH DEPARTMENT

2.2 /

The plantation sector will need to automate various stages of tea production in order to cope with growing labour shortages and changing youth aspirations.

Sri Lanka's plantation sector is characterised by high labour intensity and the production of high-valued crops for exports, such as tea (contributing 17% to exports), rubber (8% to exports)⁷⁶ and coconuts. While plantations typically refer to 'a specialised type of large farm', estate sizes vary,⁷⁷ including three variations: small holdings below 10 ha⁷⁸; small plantations either owned by families or small companies anywhere between 10- 500 ha; and large plantations over 500 ha, often exceeding 10-15,000 ha and owned by the state, large national or multinational corporations.⁷⁹ For instance, 60% of total tea land in Sri Lanka is cultivated by smallholders, contributing to over 70% of all tea production.⁸⁰ These are mostly concentrated in low and midland country, while large estates cover most of the upland areas⁸¹ Similarly, in the rubber industry over 70% of upstream⁸² activities are conducted by smallholders, whereas 90% of downstream⁸³ activities are accounted for by 15 major firms.⁸⁴

The plantation sector employs approximately 10% of the Sri Lankan workforce,⁸⁵ having experienced over 55% contraction between 1988 and 2011.⁸⁶ Women form a critical part of the plantation workforce, with their labour

force participation highest in the estate sector at 44.6%⁸⁷ and their share of employment over 50% in the sector.⁸⁸ Land owners in the small holding sector are predominantly men with over 60% ownership,⁸⁹ while women mainly work as tea pluckers and wage earners.⁹⁰ The feminisation of plantation labour⁹¹ is accentuated by the discrimination in wages; for instance, men's daily wages were Rs 794 as opposed to Rs 599 for women in 2013.⁹²

While hired labour in large plantations is organised formally⁹³, most of the labour for small holdings is casual and informal.⁹⁴ Despite reductions in poverty in the estate sector, multidimensional poverty persists with the sector experiencing the highest poverty headcount at almost 9%.⁹⁵ Moreover, 64% of the estate population is in the lowest wealth quintile; almost 44% of estate residents live in single room dwellings⁹⁶ with restricted access to water and sanitation facilities.⁹⁷ These conditions, along with changing youth aspirations are leading to a decline in plantation labour. Sri Lanka's Labour Demand Survey of 2017 has stated that the plantation sector has the highest labour demand — in particular, tea pluckers and rubber tappers, of 81.7% and 14.4% respectively.⁹⁸

Tea plucking has seen some automation in Japan and Australia with smart plucking mechanisms,⁹⁹ but, despite persistent labour shortages, there are challenges to implementing the same in the Sri Lankan context. The main barriers to technological adoption are the abundance of small holdings; geographical and

77 In 1982 the ILO amended the 1958 Convention, excluding holdings below 5 hectares. However, most plantations are usually larger, with variances between different countries.

78 Overlapping with the Tea Control Act in Sri Lanka, which states that landholdings below 10ha are considered "Tea small holdings" Retrieved from <http://www.fao.org/fileadmin/templates/est/meetings/IGGtea21/Presentation-SmallholdersSriLanka.pptx>

79 Overlapping with the Tea Control Act in Sri Lanka, which states that landholdings below 10ha are considered "Tea small holdings" Retrieved from <http://www.fao.org/fileadmin/templates/est/meetings/IGGtea21/Presentation-SmallholdersSriLanka.pdf>

81 '90 percent of smallholder production is at medium and low-grown elevations, compared to 50 percent for the organised-estate sector.' (ibid.)

82 Involves farming processing and marketing of produce.

83 Manufacturing products.

91 This is also linked to the reliance of smallholders on family labour (50% of smallholders).

climate concerns like topsoil erosion impacting high altitude plantations; and the delicacy of the tea picking process. Larger plantation companies are moving towards automation in processing and factories, as is already the case in the Karavita Tea Factory in Peenkanda such as the automation of weighing green leaf and fired tea,¹⁰⁰ automated conveyors for green leaf transfers and mechanical sifters.¹⁰¹

However, tea smallholders have poor technical knowledge coupled with limited access to necessary capital resources for investment,¹⁰² and they will unlikely be able to afford even mechanised technologies. Labour shortages are more likely to lead to the diversification of products offered by plantations, with private companies foraying into tourism¹⁰³ and organic goods to generate incomes. The introduction of mobile platforms for ‘tea apps’ has been suggested to increase market access for smallholders.

Comparatively, the rubber industry which employs around 200,000 workers is likely to experience more technological adoption, as per the Rubber Master Plan¹⁰⁴ and China’s growing interest in the plantation subsector. The industry’s output has suffered in the past decade and Chinese firms are in discussion with the plantation ministry to set up joint ventures with Sri Lankan firms¹⁰⁵, providing technical assistance and investing in Research and Development for advanced technologies. The Finite Element Analysis Simulation Centre (FEASC) has been launched under the Rubber Master Plan¹⁰⁶ with technical assistance from

the Hainan Province of China. Developments in these processes could lead to limited displacement, yet this is unlikely to impact overall employment in the sector. However, if not protected, it could harm women labourers with low social mobility and limited employment opportunities.

2.3 /

Labour shortages in the construction sector are more likely to be overcome by migrant workers rather than technology adoption.

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Labour shortages in construction are a global issue and attempts to incentivise workers through increased pay and benefits are underway in developed countries like the US.¹⁰⁷ Automation has been attempted to varying degrees, and is desirable when it mitigates issues such as weather conditions, effort, and risk to life and health; but such technological adoption still requires partial human assistance and skilled labour and is expensive. In Sri Lanka, the construction sector contributes to about 8% of the GDP, employing around 9.7% of the workforce.¹⁰⁸ Sri Lanka has also been facing labour shortages in the construction industry as many youth are not interested in working in construction labour for a number of reasons — including low income, temporary working conditions, hard manual work and poor social security benefits.¹⁰⁹ The Labour Demand Survey of 2017 has reported that one of the

93 Both in terms of unionisation and formal employment. (Sri Lanka Labour Force Survey Annual Report - 2017 [Rep.]. (2018, November 1). (ibid.))

96 Units of less than 500 square feet. (Up-country Tamil Plantation Community (Estate Sector) [Brief]. (2017, March). UPR Papers. Retrieved from [srilankabrief.org/wp-content/uploads/2017/10/SLB-UPR-Papers-03-Up-country-Tamil-Plantation-Community-Estate-sector.pdf] AND Multisectoral Nutrition Assessment in Sri Lanka’s Estate Sector [Rep.]. (2017). The World Bank. Washington DC. Retrieved from [documents.worldbank.org/curated/en/271541491297359532/pdf/113972-WP-P118806-PUBLIC-SLstatenutritionFINALreportMar.pdf]

102 The falling prices of tea leaves leading to the increased indebtedness of smallholders to leaf collectors have also contributed to their capital constraints.

105 The China Hainan Rubber Industry Group Co is also looking to invest in Sri Lanka’s rubber supply chains. China eyes major role in Sri Lanka’s plantation sector. Retrieved from <http://www.dailymirror.lk/article/China-eyes-major-role-in-Sri-Lanka-s-plantation-sector--154598.html>

“We have been working on the estate for over 20 years and we rarely get a raise. Our hands are torn from the work, because we are not allowed to wear gloves as it will spoil the tea quality. My children don’t want to work like this.”

WOMAN ESTATE WORKER,
TRANSLATED FROM TAMIL

sectors with the highest demand for labour is the construction sector with 20,193 skilled and unskilled positions to be hired.¹¹⁰ Construction costs have been on a steady increase, especially with rising prices of labour and material and exacerbated by the fact that Sri Lanka imports construction materials. Currency depreciating¹¹¹ bank loans in the construction sector have also increased dramatically over the past few years.¹¹²

The use of drones to survey construction sites and offer real time data on progress is being implemented in the US and Japan.¹¹³ Further, Modern Methods of Construction (MMC) deploy prefabricated and modular systems, manufacturing whole housing and sub housing units, reducing the need for skilled onsite labour and building time, while also standardizing quality.¹¹⁴ However, most of the advanced construction technologies require high investments, and despite the rapid growth of the sector globally, technology adoption has been slow on the uptake, mainly due to high costs and complexity in implementation.¹¹⁵ MMCs are 7-10% more expensive as compared to traditional construction methods, requiring skilled manufacturing labour and complex logistical support to transfer whole units.

While construction technologies could potentially address the sector's labour shortages, low awareness in the Sri Lankan construction industry has slowed the uptake of modern construction methods.¹¹⁶ This trend is on a gradual shift, with private companies such as Salasi Lanka partnering with Singapore's Well and Able International, to adopt prefabricated lightweight building systems.¹¹⁷ While this could impact labour demand in the sector in the long run, feasibility is likely to

challenge widespread adoption in the coming decade. Moreover, these methods are unlikely to impact larger construction projects.

Current projections indicate that the demand for construction labour is expected to rise in the coming decade, much of which will be supplied by foreign workers. As per regulations, any large project that is registered with the Board of Investment, can bring in foreign labour based on a ratio, usually 1 foreign worker for every 5 local workers. With this availability of cheap labour, there is less motivation for technology investment and adoption in construction. Employment in the construction sector will be contingent on labour policies around in-bound migration, along with trade agreements with China and others. Technology adoption is likely to be limited in the next decade despite local labour constraints, particularly since capital investment is high and migrant labour will continue to be brought in.

2.4 /

Growth in logistics will lead to increased labour demand but high automation will eventually lead to displacement.

Globally, logistics has seen expansive technological adoption and automation in various stages and processes at the level of transport; warehouse management; and distribution.¹¹⁸ These take the forms of both manual or physical process automation with advanced robots and simpler machinery assisting in lifting and shifting; cognitive automation; tracking, monitoring, and data analysis systems.¹¹⁹ Increasing demand, and

¹¹¹ Besides this, logistics costs and energy costs in funding construction projects and sites also add to the growing expenditures of the construction sector. PPPs are one way through which there have been attempts to share investment costs.

¹¹³ 3D printing is also being explored as a potential technology that could accelerate and enhance material production and procurement. (Wakefield, J. (2016, May 4). Tomorrow's Buildings: Construction industry goes robotic. BBC News. Retrieved from <https://www.bbc.com/news/technology-35746648>)

the subsequent expansion of logistics is likely to generate new employment opportunities in the coming five years. However, the adoption of advanced technologies and smart management solutions are likely to displace various middle-skilled occupations, such as supervisory and managerial positions, while also reducing the demand for permanent labour.

Logistics has been marked as a crucial sector under Sri Lanka's National Export Strategy, highlighting the sector's role in the growth and expansion of commerce and trade.¹²⁰ Sri Lanka's bid to become a major port and trading hub will have extensive implications for automation adoption and employment. Transport, storage and communications accounted for almost 6% of overall employment in 2017, with over 13% of the workforce employed in wholesale and retail.¹²¹ The combined contribution of transport, storage and retail to GDP was over 22% in 2017.¹²² With an increase in digital platforms, e-commerce activity, online trading and market spaces, demand for logistics is rising, with traditional warehousing and distribution processes experiencing a push for greater automation.¹²³

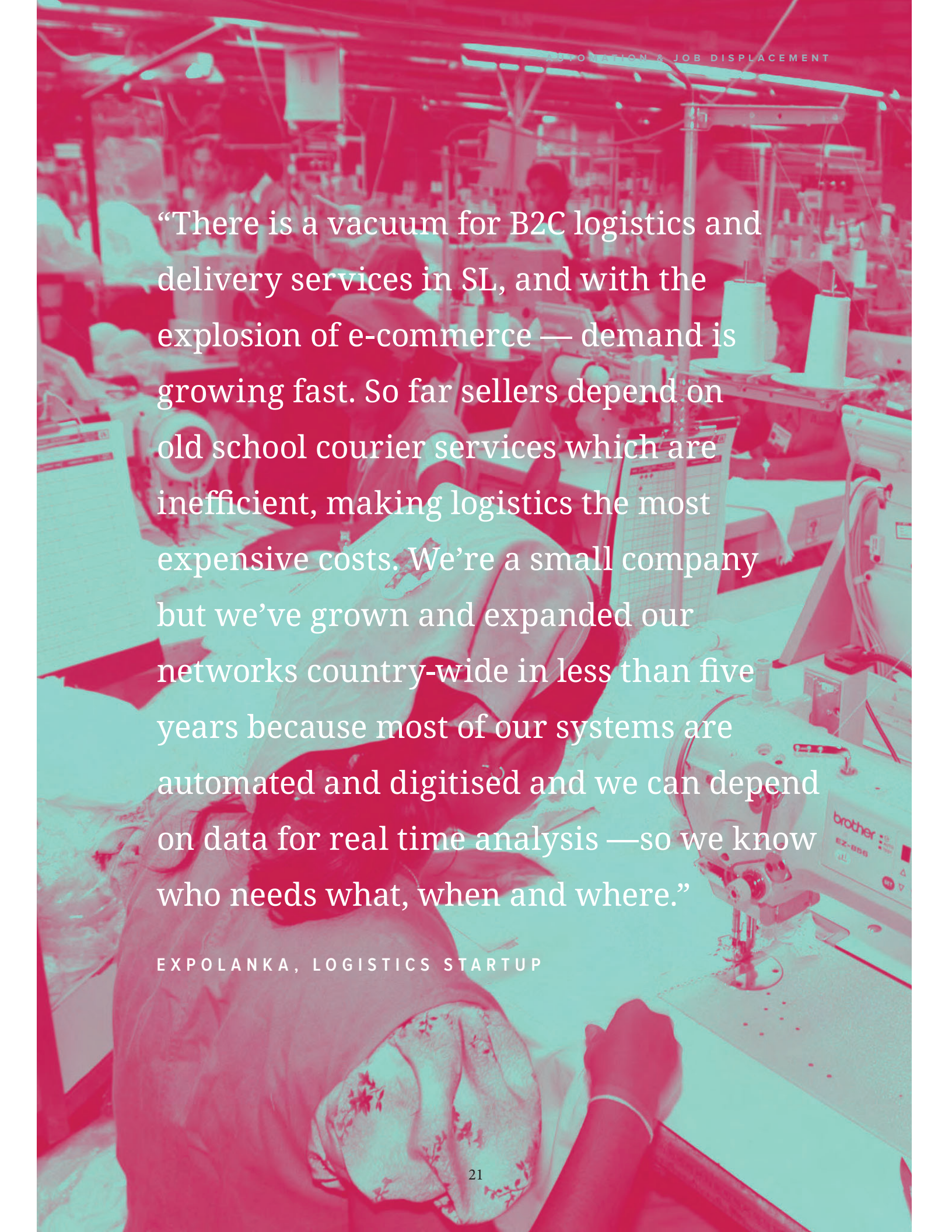
The pressure to optimise profits through lean distribution operations has accentuated with the entry of transnational corporations. For example, Sri Lanka's native Expolanka Holdings conglomerate, heavily engaged in the freight and logistics industry, partnered with global supply chain management software provider HighJump in 2016 to adopt smart logistic solutions. Expo Freight (EFL) is also expanding its e-commerce operations for global brands.¹²⁴ Even Danish shipping line Maersk recently announced its plans to offer its new 'store to door' services in Sri Lanka.¹²⁵ Sri Lanka also recently signed up to a project for 'Multi-Country Consolidation' (MCC) with investment from the Global Alliance for Trade Facilitation,¹²⁶ where this MCC facility will position the Colombo Port as a preferred entrepot destination for e-commerce companies. Alongside this, the Trans-Pacific

trade lane continues to see strong growth¹²⁷ and with major terminals in Colombo Port and Bandaranaike International Airport reaching maximum capacity,¹²⁸ there is heightened need for the expansion of logistics and port activities.

While large multinational corporations diversifying into logistical services will influence employment trends in the sector, tech-enabled startups are determining the extent and speed of technology adoption. Technology adoption in Sri Lanka's logistical sector is seeing an increase on three broad levels: back-end services, employee management, and physical process automation.¹²⁹ Back-end automation through software is extremely cost-effective and scalable, and greatly increases efficiency and productivity. It is very likely that there will be large-scale adoption of software technology to facilitate processes such as tracking, calculations, and accounting. Thus, with all these efficient automated systems in place, middle-skilled occupations will eventually become redundant and lead to significant job displacement.

Logistic operations on the level of last-mile delivery is an interest area for startup ventures. Facilitated by smartphones and e-commerce, last-mile delivery services have seen a boom in Sri Lanka. Digital labour platforms are attempting to venture into the sector with gig-based delivery services¹³⁰ such as UberEats, Grasshoppers, Quicke, and Speedee. This has led to rising interests in employee management technologies, particularly through mobile applications for managing delivery operations. For example, logistics startup SimpleX Delivery systems is working on integrating a digital delivery register through mobile applications.

These technologies will not displace low-skilled workers, but will instead affect the nature of their employment. With data-analytic tools, enabled by the digitisation of all records and operations, employers can



“There is a vacuum for B2C logistics and delivery services in SL, and with the explosion of e-commerce — demand is growing fast. So far sellers depend on old school courier services which are inefficient, making logistics the most expensive costs. We’re a small company but we’ve grown and expanded our networks country-wide in less than five years because most of our systems are automated and digitised and we can depend on data for real time analysis —so we know who needs what, when and where.”

EXPOLANKA, LOGISTICS STARTUP

assess their real time labour needs, reducing their dependence on permanent employees. Delivery agents could then be hired as needed. This will be further intensified by the growing platformisation in the economy, as logistics becomes a sector of increasing demand.

With the platformisation of services such as delivery jobs, employment is likely to be precarious insofar as workers will be part-time. With growing digitisation, there may be some degree of upskilling and augmentation of the skills required of these door-to-door delivery jobs; it will also be mediated by existing technology access, basic digital literacy along with the ability to acquire language and soft skills. Firms interviewed during field work revealed their preference for Tamil speakers in the North, Sinhalese in the South and English speakers for the Western province.

In the longer term, physical process automation is expected, especially with the increasing popularity of smart robots for warehousing management. Autonomous mobile robots are increasingly becoming popular in the organisation of storage and transportation of products.¹³¹ While this could impact employment in the warehousing segment, smart robots for logistics require high capital investments, and are not likely to be adopted in the immediate future. While employment is likely to increase across occupations and skill levels, low-skilled job creation is likely to be through temporary positions. However, this process itself will not reduce the demand for labour. While the logistics sector continues to expand, the demand for low-skill jobs, in the form of delivery agents, will continue to exist and even rise in demand due to the expansion of the logistics sector. This growing demand also indicates a potential area for growth of local startups with a localised edge.

2.5 /

Technology-led displacement will occur for entry-level and mid-skill jobs in the IT, BPO and financial sectors, and access to emerging specialised jobs will require investment in advanced skills and lifelong learning.

—

The traditional models of IT, BPO, and financial infrastructure are being disrupted globally by the rise of cost-effective and easily-adoptable automation.¹³² As entry-level and low-skill jobs get automated, shortage of skilled workers for more advanced IT is limiting the growth of the sector which already faces labour shortages.¹³³ Rapid changes in technology advancement requires that reskilling and upskilling must be sustained efforts as the chances of job loss and redundancy are very high.

Over the past two decades, Sri Lanka has established itself as one of the leading locations for Business Process Management (BPM) and IT industries. SLASSCOM aims for the industry to evolve from mere back-end processing to high-skilled functions such as knowledge management and development of innovative solutions. This is evident from both the incidence of major global players such as the London Stock Exchange Group (LSEG) setting up shop in Sri Lanka, along with an increase in startup activity, concentrated in the fields of computer science, engineering and business and finance.¹³⁴ Further, Sri Lanka's service sector has experienced rapid growth, employing over 40% of the workforce and contributing over 60% to GDP.¹³⁵ Within this, the IT sector industry currently employs about 150,000 people currently and contributes to over 12% to the country's service export,

¹⁴⁵ BPOs have primarily relied on the availability of cheap skilled labour to address demand in global markets, mainly developed economies. Once these functions are automated, the demand for BPOs will no longer exist. (The Widening Impact of Automation. (2017). ATKearney. Retrieved from [https://www.atkearney.com/documents/20152/793366/The+Widening+Impact+of+Automation.pdf]) BPOs have primarily relied on the availability of cheap skilled labour to address demand in global markets, mainly developed economies. Once these functions are automated, the demand for BPOs will no longer exist. (The Widening Impact of Automation. (2017). ATKearney. Retrieved from [https://www.atkearney.com/documents/20152/793366/The+Widening+Impact+of+Automation.pdf])

primarily serving China.

Certain IT service companies and startups founded in Sri Lanka have offered highly specialised and niche services, such as WSO2's products that integrate application programming interfaces, applications and web services,¹³⁶ and Virtusa's systems implementation and application outsourcing services.¹³⁷ These companies, including some other startups, continue to have huge success in international markets and have forged strong collaborative partnerships.

Sri Lanka's IT market is currently dominated by global demand and trends, with both large companies and startups focusing primarily on international clients. However, the adoption of IT services in Sri Lanka's private organisations, and to a limited extent, the government, in order to gain a competitive advantage is also happening.¹³⁸ For example, MAS, a top manufacturing company, is exploring collaborations with IT adoption in business-technology consultancy and large cloud-based network services.¹³⁹

High technological potential is also being seen in the financial sector, comprised of banking and insurance. In 2015, Sri Lanka's financial sector contributed 5.7% to GDP, and experienced 15.1% growth in the first quarter of 2016.¹⁴⁰ It currently employs 185,783 people as of the last quarter in 2018— an increase from the previous years.¹⁴¹ 46% of market share is held by Sri Lanka's two large state-owned banks, and the private sector domestic commercial banks hold 45% of market share. The rest is held by foreign commercial banks at 8%.¹⁴²

While technological developments are facilitating the expansion of the IT industry, BPO services and labour¹⁴³ are increasingly

vulnerable to automation¹⁴⁴ and potentially reshoring.¹⁴⁵ The ease of automation of IT and BPO services through RPA¹⁴⁶ is likely to displace mid-skill jobs including voice processes (customer care, sales calls, etc.) and data entry positions. There will be an increase in demand for BPO data analytic services in the short term, however, in the long term, this too is vulnerable to automation.¹⁴⁷ Various banks are also shifting to e-banking and digital platforms to expand their financial services and increase productivity at low environmental costs.¹⁴⁸

There are, however, challenges to technology adoption in the sector. As highlighted in the CapGemini 2017 report, collaboration between fintech firms and traditional organisations including the banking industry is marred by firms' lack of agility.¹⁴⁹ A prevalent bureaucratic culture in Sri Lanka's public sector banks is also likely to slow down technology adoption. Digital literacy is still not very high in Sri Lanka at 33.8%,¹⁵⁰ and academic and professional pursuit of IT is still largely male-dominated.¹⁵¹ Besides this, low levels of digital literacy, particularly prevalent along regional lines, is likely to impact use of financial technology services. As per a 2016 study on consumer behavior, the use of internet banking services is determined by socio-economic conditions dominated by affluent social groups.¹⁵² Banking and financial services are also incredibly sensitive areas, requiring higher safety standards. Further, trust in cyber security systems is notably low, preventing widespread adoption of fintech services (ibid).

The expansion of Sri Lanka's IT industry, mainly oriented at international markets, is likely to increase demand for high-skilled technical jobs around data analysis, cyber security and so forth. However, the BPO industry— characterised by backend repetitive

¹⁴⁶ A software automation tool that automates routine tasks such as data extraction and cleaning through existing user interfaces.

¹⁴⁷ The sector is experiencing two types of automation: one at the customer-facing level and the other internally and primarily through RPA. Sampath Bank introduced an AI-powered humanoid teller in 2017 which processes customer requests for a range of services.

¹⁴⁸ For instance, as Nation's Trust Bank launched their digital banking platform 'FriMi' in 2017, their customers increased by 28% in 2017 (as opposed to 19% in 2016), and their transacted cash value rose to 21% (excluding ATMs, up from 16% the previous year).

jobs— along with mid-level jobs in the financial sector are likely to face automation-led displacement. Technological adoption by local firms, however, will be influenced by feasibility; the availability of skilled labour along with requisite digital skills in the population; and the extent of Sri Lanka's integration in the global economy.

2.6 /

With the growth in e-commerce new markets will emerge, but, traditional retail jobs will no longer provide opportunities for social mobility for low-skilled youth.

—

The retail sector plays a significant role for youth employment in developed and developing countries. Yet middle-skill formal sales jobs — such as shop floor and sales assistants — are vulnerable to displacement. A large portion of Sri Lanka's youth could bear the burden of these losses¹⁵³ — in particular, rural youth moving out of agriculture and plantations, for whom retail was an easy stepping stone out of manual work.¹⁵⁴ E-commerce will undoubtedly expand in developing economies, opening up new markets and creating new opportunities but will further constrain employment in conventional retail.¹⁵⁵

In Sri Lanka, the largest employment in the service sector occurred in wholesale and retail trade employing 14.1% of the workforce in 2017.¹⁵⁶ Sri Lanka rose four spots on AT Kearney's 2015 "Global Retail Development Index"¹⁵⁷, reaching 14th place, ranking above India. Though, with automation being most feasible in predictable physical activity and collection and processing of data,¹⁵⁸ jobs within brick-and-mortar retail stores and supermarkets are at risk of displacement. In fact, once automation technology is uniformly adopted in the retail sector, the risk of job loss will be at about 30-50% globally.¹⁵⁹ Such applications are already being seen in Amazon

Go shops in the US, which have no cashiers or self-checkout lanes: customers simply 'grab and go' and goods are automatically registered in their Amazon Go account.¹⁶⁰

In addition to automation, there is a growing shift to e-commerce and digital markets, although these are more likely to further shape employment trends in the retail sector by enabling new markets. Asia has already surpassed Western Europe and North America in e-commerce sales,¹⁶¹ and Sri Lanka, specifically, is seeing a rise of e-commerce services in the startup ecosystem, such as Takas.lk, wow.lk, Kapruka.com, Daraz, etc. E-commerce expansion will serve to facilitate this tremendously — while the retail market will expand by 5% until 2020, e-commerce is expected to expand by 71%. New and emerging online payment systems such as Dialog Axiata's eZ Cash, and the acceptance of international payment systems like Paypal for online shopping, will further enhance e-commerce.¹⁶²

While this will generate labour demand for various positions, employment, particularly in the lower-skilled segment, is likely to be precarious. For instance, a growing need for delivery executives will likely be met by the gig economy, facilitated by the expansion of the logistics industry. Moreover, the creation of middle-skilled positions such as online sales, customer support and data collection services is likely to be temporary, as these jobs are also at risk of automation.

2.7 /

Technology adoption will lead to job polarisation in the manufacturing sector.

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The manufacturing sector plays an important role in the Sri Lankan economy, employing over 1.5 million workers and contributing around 17% to GDP.¹⁶³ The global industrial automation market is expected to grow

exponentially by 2022 and Sri Lanka, especially in terms of export oriented manufacturing, is not likely to be immune to this trend.¹⁶⁴ Within the manufacturing sector, the automation of both physical processes and back-end systems are likely to be implemented in Sri Lanka. This could lead to job polarisation, with the hollowing out of the semi-skilled, mid-level jobs, even while there is a shortage of manual labour.

The manufacturing industry has experienced the highest productivity growth —e.g. over 50% of new jobs created in the 1990s and 2000s were in the export manufacturing sector¹⁶⁵ — and created the most jobs in the private sector between 2006 and 2014. Establishments geared towards the manufacturing of food products are the highest as of 2015, at 4115 establishments and 280,601 people employed. This is followed by the apparel sector with fewer establishments at 3423, but a much larger workforce at 515,183.¹⁶⁶

Manufacturing-led employment gained momentum with renewed focus on FDI and export-oriented firms, leading to an increasing need for Sri Lankan industries to be competitive in the global market, particularly since export demand is dominated by the U.S. and Europe.¹⁶⁷ Further, while the overwhelming share of manufacturing units are small scale; 92.8% employ less than 10 people per unit, while large and medium companies still engage over 70% of the manufacturing workforce. Both these factors are indicative of high technology potential — as automation requires economies of scale, while transnational trade and partnerships suggests the influence that advanced economies with strong technical advantages can exert.

Certain capital-intensive industries have adopted automation and mechanisation to

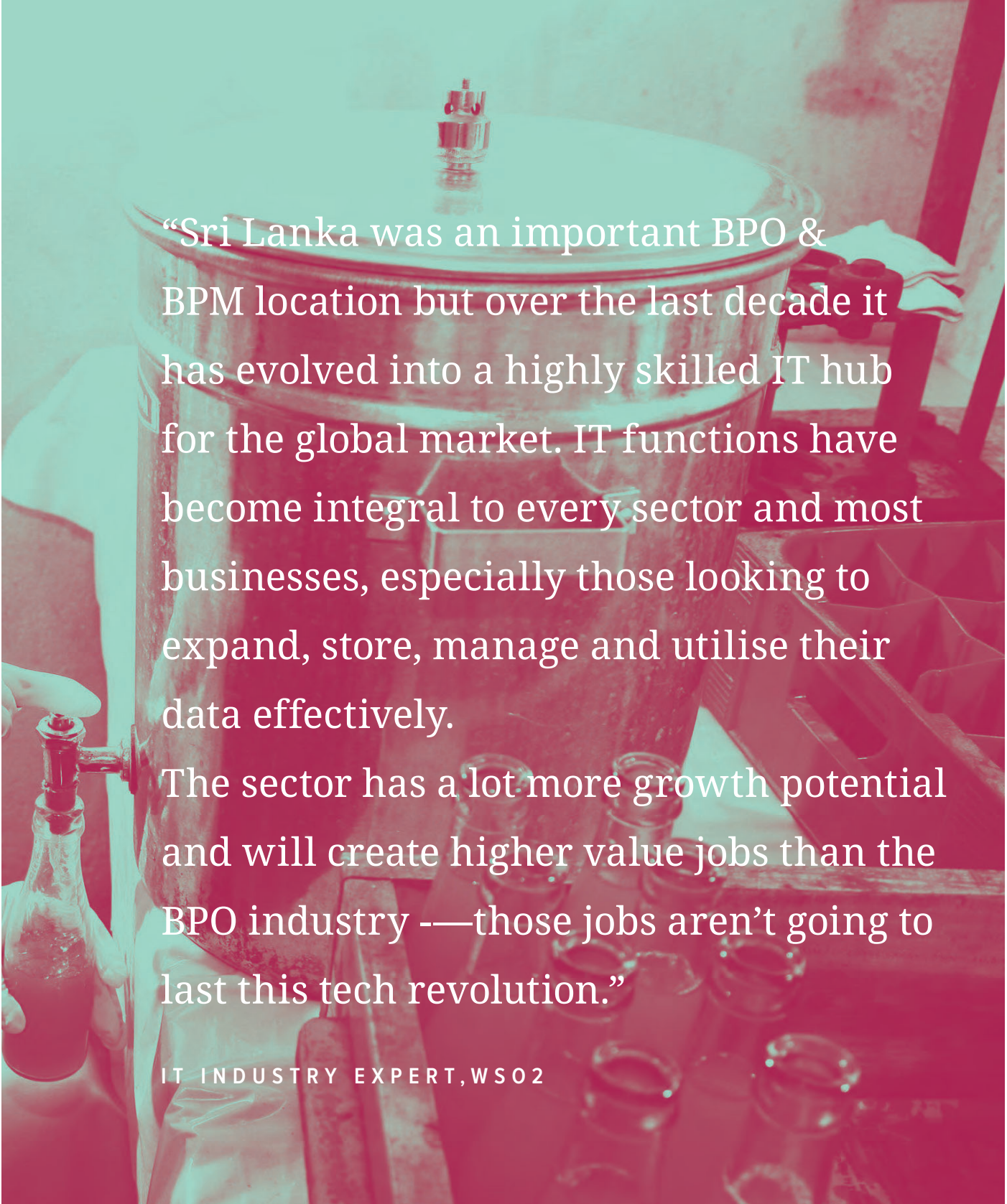
a great degree. Companies like IWS Holdings, for example, claim to operate completely automated systems for food processing and packaging.¹⁶⁸ Food production and manufacturing has been selected as a priority industry by Sri Lanka's National Export Strategy for 2018 to 2022,¹⁶⁹ focusing on the facilitation of raw materials, improvement and modernization of food safety controls, as well as reinforcing national branding for processed foods and beverages.¹⁷⁰ Not only is automation feasible, but the industry has also seen great productivity. The food and beverages segment has increased in value over the last few years; and as of 2016, it was valued at Rs. 344,500 million.¹⁷¹

The majority of work in apparel manufacturing does not lend itself to automation, as it is non-routine, requiring dexterity and agility, thus rendering labour a cheaper and more efficient option. Industry informants reveal that while large scale export-oriented firms are moving towards technological adoption to increase productivity and meet rapidly rising demand, it is unlikely to be labour-displacing. Instead, firms are looking at 'autonomation' practices, using technologies to enhance labour productivity rather than replace humans altogether.¹⁷² The initiation of the 'co-bot' in Sri Lanka, a collaborative, industrial robot that works with humans, further corroborates this.¹⁷³ An affordable investment, the co-bot is expected to enhance value added per output, potentially increasing labour productivity by 85%.¹⁷⁴ Co-bot distributors in Sri Lanka indicated increasing demand from large-scale, export-oriented apparel manufacturers. However, the deployment of co-bots in apparel manufacturing is still limited.

Leading IT firms serving domestic industries also indicate that the deployment of emerging technologies, like industrial automation and

¹⁷² For instance, the 'dancing module.' (Muller, D. (2015, October 9). Dancing at work.. Increase productivity, efficiency and earnings... LinkedIn. Retrieved from [<https://www.linkedin.com/pulse/dancing-work-increase-productivity-efficiency-earnings-david-muller>])





“Sri Lanka was an important BPO & BPM location but over the last decade it has evolved into a highly skilled IT hub for the global market. IT functions have become integral to every sector and most businesses, especially those looking to expand, store, manage and utilise their data effectively.

The sector has a lot more growth potential and will create higher value jobs than the BPO industry —those jobs aren’t going to last this tech revolution.”

IT INDUSTRY EXPERT, WSO2

“The popular assumption is that all manufacturing has high tech potential across the board — that robots are going to take over factory jobs across the globe. But we predominantly manufacture apparel and we depend on human labour for making the actual product. Of course we are adopting new technologies— global consumers want cheap products, they want it fast and they want it to be unique. We’re digitising and integrating all our systems so that we can use data analytic tools to manage all our processes— not so much to reduce our workforce but to scale up and handle our processes seamlessly.”

MAS GARMENT MANUFACTURERS

artificial intelligence, is at a nascent stage in Sri Lanka— limited to middle-skilled routine jobs such as clerical, supervisory and managerial positions.¹⁷⁵ Thus, increased labour productivity through automation could reduce dependence of permanent labour in the long run, while middle-skilled routine jobs are likely to get automated in the coming decade. Niche capital and technology-intensive industries, such as food processing will continue to see a high level of automation of physical processes. However, middle-skill level jobs across organised manufacturing will be majorly affected due to digitisation and back-end automation.

2.8 /

The public sector will be shielded from technological disruption, despite high automation potential.

—
In the absence of a generation of jobs that meet the aspirations of the youth within the private sector over the last two decades, they have queued for public sector jobs. There are strong cultural preference for public sector jobs that are seen as stable and respectable and with social security benefits like maternity leave and pension. Sri Lanka's public sector is very expansive, both in terms of size and influence, and in the absence of targeted efforts it is likely to be exempt from significant impact by technology disruption.¹⁷⁶

In 2016, Sri Lanka's public sector employed 14.6% of the workforce¹⁷⁷ and contributed over 50% to the overall job growth between 2006 and 2014.¹⁷⁸ Further, many graduates— particularly from lower socio-economic sections, specialise in Arts and Humanities, as tuition and investment costs are significantly lower as compared STEM subjects, preventing their access to high-skilled jobs in the IT sector.¹⁷⁹

Unqualified for high-skilled professional jobs, young graduates are also not interested in low-skilled jobs in services, and labourious ones in manufacturing.¹⁸⁰ Public sector jobs are therefore sought after. However, this is not sustainable. Sri Lanka's Government debt accounted for 77.4 % of the country's GDP in December 2017, with an emphasis on non-discretionary expenditure in salary bills. Despite being a huge employer with a workforce of around 1.5 million, the overall efficiency of the sector has been slated to be only around 35%.¹⁸¹

E-governance efforts have not taken off or yielded efficiencies in the public sector. The 2016 Census of Public and Semi Government Sector Employment has indicated that although 100% of public sector employees are able to use a computer, only 36.4% of them actually use one for official duties.¹⁸² Sri Lanka's Information and Communication Technology Agency (ICTA) has initiated various projects such as the Lanka Government Cloud 2.0, the Lanka Government Network and Wifi Facility, and eSamurdhi integrated welfare management program.¹⁸³ Though, low rates of computer literacy among the citizens have challenged e-governance efforts technology.¹⁸⁴ Efficiency of e-governance strategies, thus, need to be enhanced and security¹⁸⁵ and privacy of public data ensured.¹⁸⁶

The success of the state's e-governance strategies will depend on proper educational and training efforts, along with changing popular notions and perceptions around technology and bureaucracy, within and outside the governments. Sri Lanka's burgeoning startup culture offers a stark contrast to the public sector; the engagement between the two will go far in shaping technology and employment trajectories in Sri Lanka.

¹⁷⁶ In terms of providing decent work opportunities in the private sector and simultaneously reducing the size of the public sector.

¹⁸⁰ "The Industry sector reported the highest demand (195,474) and followed by the services sector (188,020) and the Trade sector (110,770). Labour demand reported for construction sector was 20,224 followed by tourism and agriculture (plantation) sector which was 10,207, and 3037 respectively." (Sri Lanka Labour Demand Survey 2017 [Rep.]. (2018). Department of Census and Statistics. Retrieved from www.statistics.gov.lk/industry/Labour_Demand_Survey_2017_Report.pdf)



A person is seated at a desk in a warehouse or industrial setting, working on a laptop. The background is filled with tall stacks of cardboard boxes. The entire image has a semi-transparent red overlay. The text is white and positioned in the upper right quadrant of the image.

“The challenge with e-commerce is earning consumer trust and scale in a small country like SL, and this is critical because we have thin profit margins, so we’re also looking to expand in the region. And honestly, automation is the foundation for the industry- all our backend systems are automated and we are looking to adopt AI applications for marketing as well. The idea is to grow across countries without necessarily hiring more people.”

E-COMMERCE STARTUP TAKAS

Conclusion

Various repetitive, middle-skilled jobs such as supervisory and managerial positions are at risk of automation, especially in areas such as retail, IT, logistics and finance. While this is unlikely to cause widespread displacement in Sri Lanka in the coming decade, small-scale technology-led disruptions will impact Sri Lankan labour markets in various ways beyond net displacement and job creation. For instance, the vulnerability of middle-skilled jobs will affect social mobility for youth moving out of agriculture. The short-term impact of technology adoption is likely to shape the nature of employment, along with working conditions with a differential impact across social groups.

Though impact will be different across various sectors, two elements can be noted throughout: one, low and middle-skill jobs will be the most threatened; and two, automation is not about feasibility alone. This goes beyond job numbers — social mobility and precarious working conditions, amongst other variables, will need to be considered. Broader dimensions of work are taken up in the next chapter on Employment Conditions.

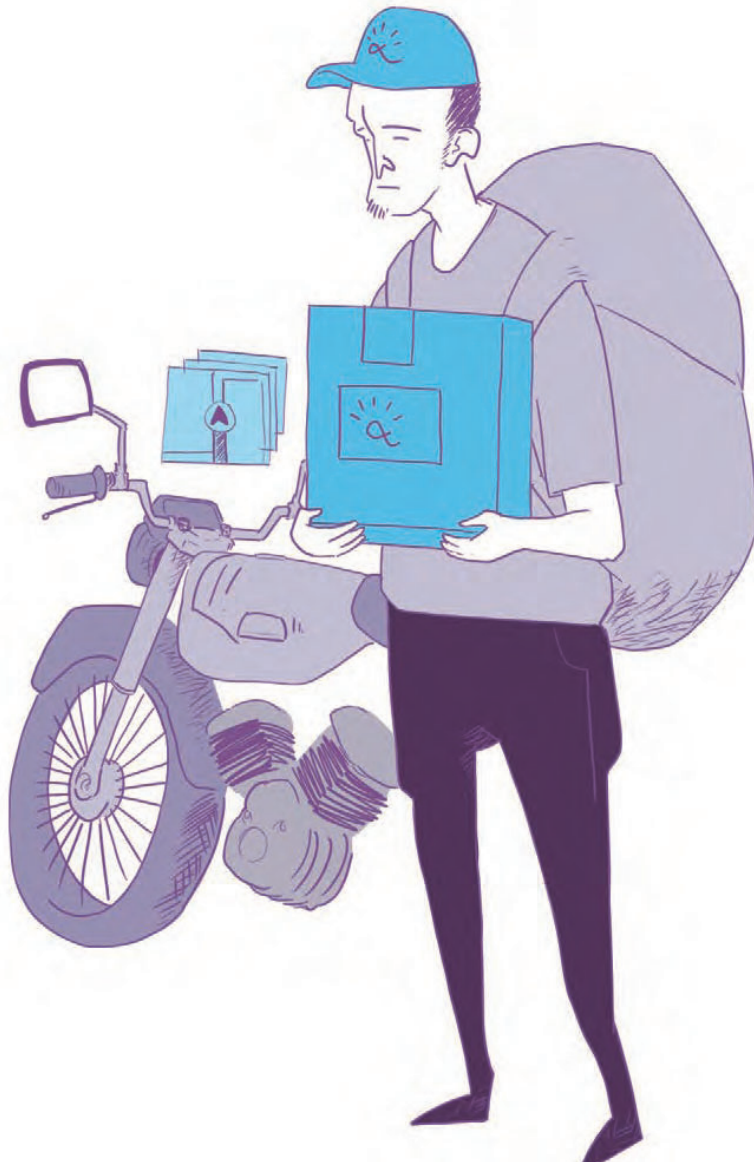
Chapter 3 / Employment Conditions

The spread of digital technologies and management practices of firms will affect employment conditions. On one hand, worker aspirations, particularly of young workers, will influence jobs expectations.

Employment conditions include not only working conditions — e.g. the working day, additional hours, rest periods and wages — but also issues of promotion, transfer and dismissal.¹⁸⁷ Characterised by job security, standard work timings, and a formal employment contract outlining income and social security benefits, permanent formal employment has traditionally served as the decent work standard for developed countries, and the aspirational ideal for developing ones. Informal employment, on the other hand, typically signifies the absence of these employee safeguards.¹⁸⁸

However, these standards are shifting, even in the developing world. Formality is increasingly becoming ‘casualised’, with less associated benefits and security for employees.¹⁸⁹ In Sri Lanka, the divergence from standard forms of employment is reflected in increasing demand for flexible work, often both from employers and employees, and the platformisation of services, especially within the manufacturing sector.¹⁹⁰

This section will consider the various ways in which emerging technologies will impact employment conditions, particularly looking at the nature of employment; the platformisation of work; work-culture and employee management; and collective bargaining mechanisms.



Anthony Sebastian is a 22 year old graduate living in Kandy, now seeking a public sector job — an aspiration shared by many of his friends and classmates. But like many his age, the pursuit of decent work in the public sector is stalled by inefficiencies like the steady increase of state debt and over-saturation.

Anthony feels he would not fulfill his aspirations if he took up a low-skilled position, but he is also unqualified for higher-skilled positions in the growing private sector. He found interesting job positions online for the a project to connect Sri Lanka and India via bullet train, but he did not have the right skills to impress his potential employers.

Anthony's friend recommended some digital platforms to find a job, where Anthony was able to find many job postings for delivery services and freelance content moderation. His salary is limited, but he is sometimes able to get big tips from well-paying customers who ask him to deliver food and other items over long distances. Anthony has plans to join a technical skilling program, but is having difficulty finding time for applications in between gig-work.

3.1/

Non-standard forms of employment will increase, particularly for low-skilled occupations.

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The casualisation of work¹⁹¹ and non-standard forms of work¹⁹² is increasing, with over three quarters of workers¹⁹³ across the globe outside regular, standard employment.¹⁹⁴ (See *Figure 2 for categorization of non-standard work*). The ILO's 2015 tripartite meeting of experts on non-standard forms of employment highlights the strain on manufacturing, which has led to the outsourcing and subcontracting of labour, hired under short term contracts.¹⁹⁵ Even as Sri Lanka experienced positive employment growth over the past two decades, 56% of total wage employees of 2.6 million were temporary and casual workers as of 2013, of which 90% were attached to the private sector. While permanent employees in the private sector increased by 15,000 between 2006-13, temporary and casual jobs witnessed a far greater growth of 350,000 in the same period.¹⁹⁶

Standard jobs typically signify access to decent work with higher wages and regular employment, ideally accompanied by social security benefits such as health insurance, pension and paid leave. This is evident in the 89% wage difference between standard and non-standard forms of employment (*ibid*). Although temporary and casual workers are covered under the Employee Provident Fund (EPF) Act, over 85% do not have access to provident funds or pension schemes.¹⁹⁷

Standard employment is expensive for employers; aside from wages, employers are required to provide other benefits such as social security and insurance coverage.¹⁹⁸ The need to stay agile and compete in global markets is pushing firms to cut costs through technological adoption and the casualisation of work.

Trade liberalisation considerations in Sri Lanka are likely to increase competition for export-oriented and multinational firms, and increasingly so for SMEs functioning in domestic markets. The startup ecosystem with its demands of scalability, built on the success of Sri Lanka's BPO and IT sectors, is likely to further the integration of SL in the global economy.

Technology adoption is one of the determinants of non-standard forms of employment, along with demand fluctuations, labour market flexibility, increasing competition and cost-saving strategies.¹⁹⁹ Automation, both of physical process and cognitive tasks, simplifies work processes, thus reducing the need for permanent low-skilled labour. Firms no longer need to invest in extensive training for such occupations and can hire workers on short notice.²⁰⁰ Temporary work and fixed-term contracts are more prevalent in lower-skilled positions. With the changing role of workers and the spread of digital technologies, basic knowledge and computer workers — e.g. click workers and Amazon turks — increasingly fall in the low-skilled spectrum.

188 There have been differences amongst scholars as to whether formality and informality should be measured in terms of individual workers, firms or the nature of the work. For the purpose of this report, formal employment is considered separately from the 'formal sector' describing the relationship between employers and employees. (Henley, A.; Arabsheibani, R. G.; & Carneiro, F. G. (2006, November). On Defining and Measuring the Informal Sector [Discussion Paper No. 2473]. IZA. Bonn. Retrieved from [<http://ftp.iza.org/dp2473.pdf>])

191 Refers to the process of casualising standard work economy into non-standard work economy.

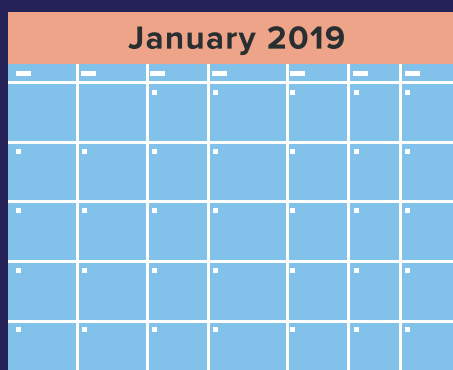
192 ILO: "Non-standard forms of employment" is an umbrella term for different employment arrangements that deviate from standard employment. They include temporary employment; part-time and on-call work; temporary agency work and other multi-party employment relationships; as well as disguised employment and dependent self-employment. Non-standard employment features prominently in crowd work and gig work. (Non-standard forms of employment. (n.d.). International Labour Organization. Retrieved from [<https://www.ilo.org/global/topics/non-standard-employment/lang-en/index.html>])

FIGURE 2 / INFOGRAPHIC NON-STANDARD EMPLOYMENT³⁵⁴

Non-Standard Employment

Temporary Employment

Fixed-term contracts, including project or task-based contracts; seasonal work; casual work; including daily work.



NOT
OPEN ENDED

Part-Time & On-Call Work

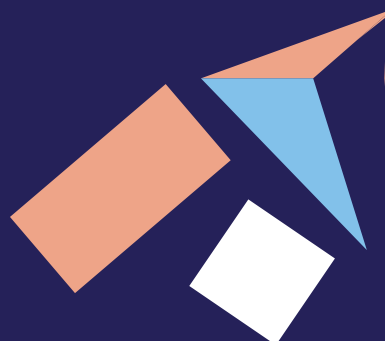
Normal working hours, fewer than full-time equivalents; marginal part-time employment; on-call work; including zero-hours contract.



NOT
FULL-TIME

Multi-Party Employment Relationship

Also known as 'dispatch', 'brokerage' and labour hire. Temporary agency work; subcontracted labour.



NOT DIRECT,
SUBORDINATE
RELATIONSHIP
WITH END USER

Disguised Employment/ Dependent Self-Employment

Disguised employment, dependent self-employment, sham or misclassified self-employment.



NOT PART OF
EMPLOYMENT
RELATIONSHIP

FIGURE 3 / INFOGRAPHIC.³⁵⁴

CATEGORIZATION OF DIGITAL LABOUR PLATFORMS



The correlation between permanent employment and high-skilled occupations is likely to remain, as these jobs require a complex skill set, ranging from creative, technical to interpersonal and leadership abilities.

The expansion of the manufacturing sector with export promotion strategies such as the setting up of Export Processing Zones (EPZ) like Katunayake—largely focused on garment manufacturing—has led the trend of temporary employment in Sri Lanka in recent years. Manpower agencies have played a significant role in enabling temporary work in EPZs like Katunayake. While these EPZs are not exempt under Sri Lanka's strict labour laws, implementation of labour laws is more relaxed in these areas.²⁰¹ In response to the growing casualisation of work, trade unions have proposed an amendment to the Wages Ordinance²⁰² to ensure that temporary employment only occurs in temporary jobs; i.e. where the nature of work itself is temporary.

Yet, this trend is likely to get exacerbated across sectors, directly and indirectly influenced by global competition with the push for Foreign Direct Investment (FDI).²⁰³ Various AI applications are likely to intensify temporary hirers. For instance, employers in the expanding logistics sector currently engage delivery workers through full time, standard employment. However, once their data analytic tools and AI applications are mature enough to predict when, where and how the demand for delivery services fluctuate, employers will be better positioned to hire workers on a need basis.²⁰⁴ An increasing deployment of HR technologies such as data analytic tools that allow employers to forecast and manage their labour needs in real time, supplemented with the persistence of manpower agencies, will support the casualisation of work.²⁰⁵

3.2 /

As platformisation of work increases, it will weaken conventional labour protection mechanisms.

Digital labour platforms – “include both web-based platforms, where work is outsourced through an open call to a geographically dispersed crowd (“crowdwork”), and location-based applications (apps) which allocate work to individuals in a specific geographical area”.²⁰⁷ (See Figure 3). The spread of digital platforms is defined as the ‘platformisation’ of work.

The emergence of online digital labour platforms over the past decade is restructuring the relationship between employers and employees globally. Comprehensive data on the number of workers engaged on digital platforms is absent, however the market for digital work alone was estimated to be 4.4 billion dollars in 2016, with their use expected to grow at an annual rate of 25%.²⁰⁸

Studies estimate that between 17-22,000 Sri Lankan workers are engaged in web-based digital labour on global platforms.²⁰⁹ Local platforms such as ‘Second Team’ are also gaining traction, engaging almost 3000 digital workers.²¹⁰ Local cab aggregation application PickMe and the global giant Uber are also spreading across Colombo, and rapidly so in other regions such as Negombo in the north, Kalutara in the South and Kaduwela in the East.²¹¹ In a year after its conception in 2015, Pickme had over 3000 tuk tuk drivers and 4000 cab drivers operating their platform. The expansion of PickMe and Uber beyond Colombo is likely to intensify this engagement, particularly as these platforms diversify their services i.e. PickMe is foraying into logistics and food delivery in Colombo, while Uber has

²¹⁵ While drivers who were interviewed mentioned that their total work timings did not reduce, even increasing on some days, they were able to take time off during the day if needed.

already begun this through Uber Eats.

The platformisation of labour has various implications. ‘Gig’ or ‘on-demand’ work accomplished on labour platforms falls under the categorization of non-standard forms of employment.²¹² Digital labour platforms have arguably eased access to new and varied work opportunities, while also providing flexibility to both employers and workers. Yet, as various studies have noted, work in the gig economy is precarious and erodes workers’ livelihoods and rights in significant ways, particularly for those who rely on platforms as their main source of income.²¹³

Drivers (of cabs and tuk tuks) currently enjoy relatively decent wages on PickMe and Uber, averaging around 2-3000 LKR per day,²¹⁴ along with flexible work timings between 8 and 12 hours per day.²¹⁵ However, the business model of these platforms relies on algorithmic processes, which privilege platforms, and are typically invisible to workers even while they have clear consequences for their earnings and ratings. Drivers in Colombo are beginning to face the brunt of this, as emphasized in recent protests in October 2018, where they demanded a reduction in commission rates charged by the platform.²¹⁶

While location-based service platforms are currently focused in Colombo, a significant share of crowd workers are based in different parts of Sri Lanka.²¹⁷ Even as location-based services expand across Sri Lanka, the scalability of their operations in remote regions and those located in the North and East is challenged by low demand and supply, as well as infrastructural constraints. Web-based digital labour, however, circumvents physical barriers, and is unlikely to face similar challenges. Nonetheless, workers on international online platforms, such as Microworkers,²¹⁸ are vulnerable to discriminatory practices in serving global and largely western demand.

Digital labour has been compared to outsourcing processes such as Business Process Outsourcing (BPO). Yet crowd work platforms depart from BPO work insofar as ‘they allow business processes to be outsourced without the mediation of formal BPO organisations’,²¹⁹ in effect commodifying work as a ‘computation service’.²²⁰ Similar to BPO practices, studies reveal how non-western workers are often poorly paid on such digital labour platforms.²²¹ Sri Lankan workers on crowd work platforms struggle in navigating payment gateways as international payment systems such as Paypal— most commonly used on these sites— are not functional in Sri Lanka.²²²

The bulk of web-based digital labour in Sri Lanka is part-time and is likely to continue being so, with anecdotal evidence suggesting that many drivers don’t use Uber or PickMe full-time. While full-time work in the gig economy is unlikely to be sustainable, current technology and labour trends indicate that part-time jobs, and access to multiple jobs are likely to expand over the coming decade. However, the expansion of location-based services is likely to be strained due to labour constraints.

3.3 /

Technology adoption for human resource management is likely to rapidly transform work culture.

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The application of integrated human resource management systems (HRMS), along with emerging technologies such as cloud computing, mobile applications and artificial intelligence, is rapidly being adopted across the globe, especially by large companies with a multitude of departments and subsequent large labour needs.²²³ In 2016 alone, US companies invested over 2 billion in HR

“With increasing internet penetration, the prevalence of crowd work is growing in regions beyond Colombo, mostly as a part time engagement. Very few crowd workers cited platforms as their main source of income—most workers typically earned \$100-200 through the gig economy. Their earnings further reduced since the usage of international payment gateways is heavily constrained in Sri Lanka.”

SL RESEARCHER ON CROWD WORK

technologies — a trend that is estimated to grow at an annual rate of 15%.²²⁴

HR technologies broadly cover workforce management, payroll and administration software (Human Resource Information Services); Human Capital Management Software that assesses employee development and workforce optimisation; and tech-enabled platforms focused on hiring and staffing functions. Another area where technology adoption has serious human resource implications is employee surveillance. Perhaps the most controversial example of surveillance technology in the recent past is Amazon's employee smart wristband, which uses ultrasonic tracking to 'monitor performance of assigned tasks' of workers in Amazon's fulfillment centers.²²⁵ Yet simpler technologies such as CCTV cameras have been in use for decades to monitor workers, along with clocking mechanisms such as entry registration which evolved into Biometric Time and Attendance Systems to keep track of employee working hours.

Many of the union members interviewed in Sri Lanka commented on the prevalence of older surveillance technologies such as CCTV cameras in factories, particularly in export processing zones (EPZ). A representative of the telecom provider Dialog discussed the use of the company's open source platform for the deployment of employee surveillance applications. Many of Dialog's corporate clients are keen to use its mobile data and applications to track their employees, particularly sales workers in the service sector.

While there is a paucity of data around firm level investments in HR technologies in Sri Lanka, firms— especially multinational, export-oriented and large corporations are rapidly looking to integrate HR technologies in their Human Resource systems. Most of these large firms already deploy Human Resource Management systems and software, moving to the collection of employee data at the firm level. Multinational companies, such as garment

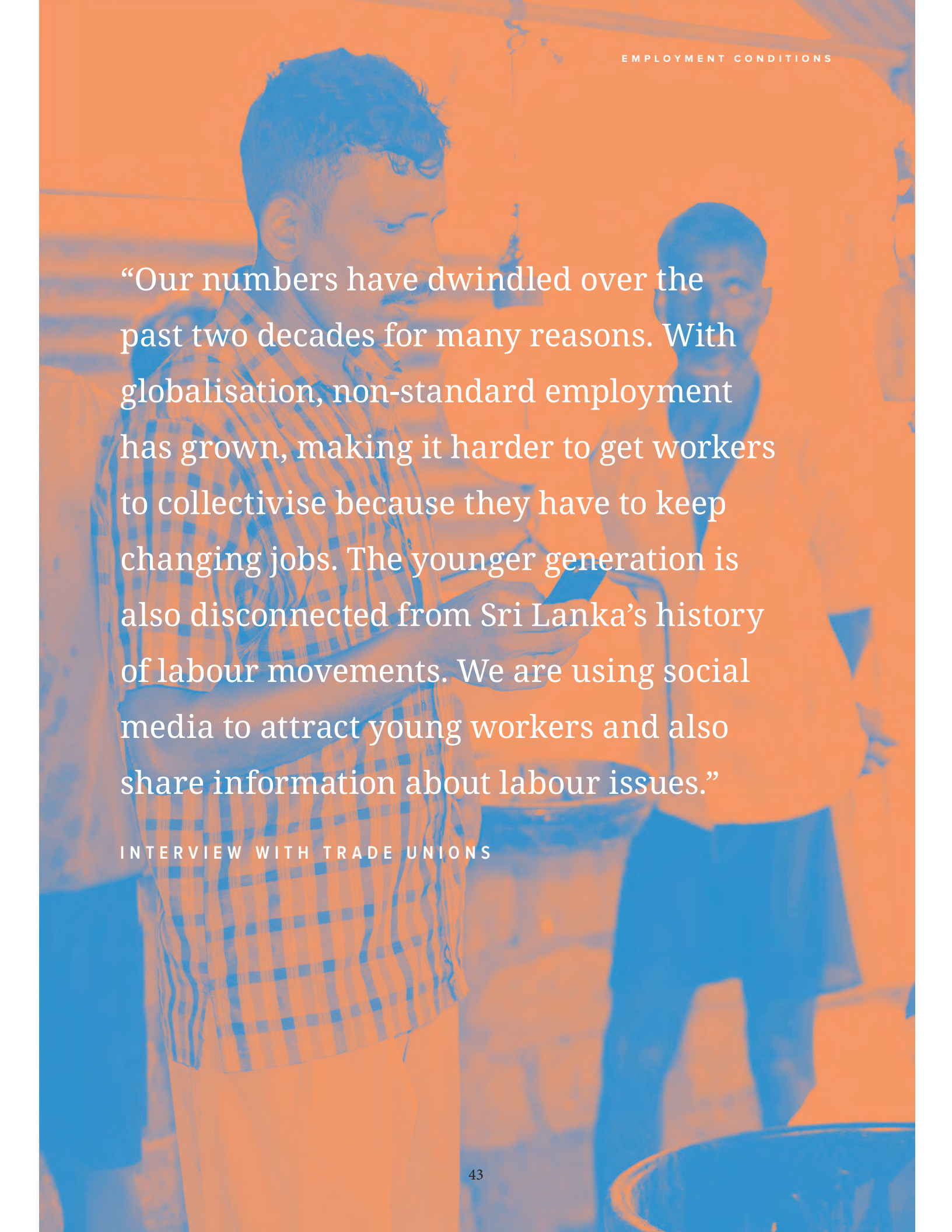
manufacturers MAS Holdings, IT developers Virtusa and WSO2, are experimenting with various applications of HR technologies through cloud computing and data analytics, which allows for real time assessment of their HR and management practices and builds on existing HR software.

The implementation of technological solutions for workforce management are impacting work cultures in different ways. For instance, remote monitoring and surveillance technologies allow firms to check on their employees from any location at any point, enabling the feeling of perpetual supervision. Further, the platform economy along with Sri Lanka's growing startup culture are diluting the importance of fixed working spaces, giving rise instead to various other working arrangements. While many people, especially women, prefer to work out of home, coworking spaces are gaining momentum in Colombo. Especially for startups, coworking spaces have helped in hugely reducing overhead costs. Changing hiring practices are likely to render staffing agencies obsolete in the long run, using social media as hiring platforms. Many of the startups interviewed indicated a preference for social media networks for recruitment purposes. Increased internet penetration and high social media usage can also alert workers in remote parts of Sri Lanka of job availability.

Much of these trends are concentrated in Sri Lanka's economic capital, Colombo, and mainly affecting large companies.

“Data analysis is revolutionising HR practices. Managing your company workforce is a huge, often hidden expense — the challenge is that a lot of the time we build our HR systems on hunches, or retrospectively. The centralisation and assessment of real time data — for each employee, team and employer — can radically ease this burden. The IT industry has been the fastest to adopt HR technologies, but uptake is high across sectors, especially for big companies with a large workforce.”

IT INDUSTRY EXPERT



“Our numbers have dwindled over the past two decades for many reasons. With globalisation, non-standard employment has grown, making it harder to get workers to collectivise because they have to keep changing jobs. The younger generation is also disconnected from Sri Lanka’s history of labour movements. We are using social media to attract young workers and also share information about labour issues.”

INTERVIEW WITH TRADE UNIONS

3.4/

Collective bargaining and traditional forms of unionisation will weaken with the proliferation of non-standard work.

The ILO recognizes collective bargaining as a fundamental right, covering all workers in the economy. By their definition, collective bargaining ‘concerns terms and conditions of work and employment, and the regulation of relations between employers and workers and their respective organisations’.²²⁶ Currently, Sri Lanka has over 2000 registered trade unions engaging over 9.5% of the workforce.²²⁷ Over 50% of the unions are in the public sector, with the private sector share at 18%, however, trade union membership in Sri Lanka has been declining over the past few decades.²²⁸

Political conditions and the push for modern work environments²²⁹ are affecting collective bargaining practices, especially unionisation.²³⁰ The rise of non-standard forms of employment and the outsourcing of IT & BPO services is making organising on the job significantly harder, since employment can be easily terminated. With Sri Lanka’s integration into the global economy, the labour movement faced issues of ‘membership decline and loss of bargaining strength’ in many traditional sectors of industry and commerce opened to global competition.²³¹ Collectivisation is particularly challenging to organise in EPZs, despite EPZ workers having the same right to freedom of association. Much of this has been attributed to the discouragement of union activities and the promotion of a ‘separate set of labour guidelines for special investment and export processing zones to deal with industrial relations issues.’²³² Uneven application of labour

regulations by government bodies is a factor.

Furthermore, the expansion of labour platforms is transforming the employment relationship. Most white-collar workers in web-based digital labour are engaged on foreign platforms such as Fiverr, Freelancer and Upwork. In the absence of shared working spaces, along with the presence of a tenuous employment relation with an absent or invisible employer, remote platform workers are unable to connect with other workers within the digital, freelancing ecosystem.²³³

Workers on location-based service applications such as PickMe and Uber have reportedly approached general unions for help in collective bargaining efforts.²³⁴ However, platform owners such as Uber have repeatedly denied their employer status in various countries, claiming that drivers on their platforms are, in fact, only independent contractors.²³⁵

Trade unions across the globe have been experiencing a decrease in youth participation, as younger workers move away from unionisation.²³⁶ To address this issue, unions are digitising various processes and increasing their use of social media to reach out to the young workforce. A recent protest in Colombo related to terms and conditions of work in the plantations was organised by youth groups through social media. Even as youth participation in trade union activities is likely to reduce in the coming years, digital and social media platforms may enable new forms of remote collectivisation.

²²⁹ Linked to the practices of neoliberalism.

²³² This, the unions felt, was being done to ensure that foreign investors’ demand for “docile” labour are met. (Ranaraja, S. (2013, January). Emerging Trends in Employee Participation in Sri Lanka [Working Paper No. 46]. Industrial and Employment Relations Department International Labour Organization. Geneva. Retrieved from [https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---dialogue/documents/publication/wcms_206005.pdf])

Chapter 4 / Labour Market Inequities

With an increase in real wages, a reduction in working poverty, and one of the highest literacy rates in South Asia, Sri Lanka enjoys healthy human development indicators. However, considerable socio-economic inequities persist along the lines of gender, ethno-religious, region and skills. While technological disruptions and digitisation can work towards levelling the playing field, the existing social inequities are likely to get reproduced or even further entrenched with the spread of new technologies. This chapter analyses how socio-cultural factors, regional, political and economic differences shape the distribution of technology gains.



Nirmali Kulasinghe is 40 year old woman working remotely as a content writer. As a mother of two and her husband no longer in the picture, she must hold a job that allows her to spend time at home with her children. After being unemployed for 10 years, Nirmali scrambled to find work online where she can utilise her writing skills. She was relieved when her friend suggested she look up Podijobs, Sri Lanka's homegrown digital labour platform, dedicated to helping women access work remotely.

Nirmali successfully balances her full-time domestic duties with 15-20 hours of weekly work, but the hours still vary based on each project and availability of new assignments. Her work continues to be precarious— inconsistent in terms of access and pay — which ultimately limits the possibility of financial sustainability. Despite this, she is happy to have found a form of financial independence. Nirmali was recently invited to a group on social media which connects her with other content writers, and she feels better knowing she belongs to a growing community of women just like her.

4.1 /

Women will be able to avail new economic opportunities but the gendered division of labour will persist.

The platform economy will allow women to work remotely and flexibly while managing household responsibilities. However, women will still face various sociocultural and economic challenges in terms of access and engagement in the workforce, most of which remain unaddressed by digital and emerging technologies.

Despite high literacy rates, Sri Lanka has the 28th largest labour force gender gap in the world, with women's Labour Force Participation Rate (LFPR) at a low of 36.6%²³⁷. The burden of unpaid housework is the main deterrent for women entering the workforce, with 62% of women economically inactive due to the same, as opposed to 6% for men.²³⁸ Moreover, marriage acts as a hindrance for women to engage in the workforce, lowering women's odds of becoming a paid employee by 26%, whereas it increases the odds for men by 3%.²³⁹

The increasing absence of women from Sri Lanka's workforce is only offset by the irony of women's waged work which has supported decades of growth in Sri Lanka. At over 75%, an overwhelming share of 'contributing family workers'²⁴⁰ are women, largely concentrated in agriculture.²⁴¹ A large number of unskilled and semi-skilled female workers leave the country and their families to work as housemaids, primarily in the Middle East,²⁴² and over 50% of plantation labour continues to be female.²⁴³ Moreover, women face discriminatory wage

practices such as an earning gap of 15.9%.²⁴⁴

Digital technologies, labour platforms and a changing work culture are enabling remote and flexible work, particularly for white collar jobs. Large export-oriented companies, such as IT service provider Virtusa²⁴⁵ are experimenting with flexible working arrangements for regular and part-time employees.²⁴⁶ The Gallup World Poll covering 142 countries revealed that over 40% of women respondents prefer work situations where they can balance domestic responsibilities with work.²⁴⁷ Stay-at-home mothers and housewives, as well as single women unable to travel for work, are moving towards the gig economy. Platforms such as SecondTeam²⁴⁸ experience high interest from women workers in such situations.

The digital economy allows women to circumvent both mobility and cultural barriers, while also enabling them to move towards equal pay opportunities.²⁴⁹ Despite the high gender gap of 40% in mobile internet use²⁵⁰, targeted efforts — e.g. telecom operator Dialog in establishing a formal connected women committee — are likely to assist more women to access the digital economy.²⁵¹

While this trend is likely to grow and enable women's participation in Sri Lanka's workforce, it will not ease the unequal burden of domesticity that women face.²⁵² In the absence of formalized care services, the pressure of care of an aging population is likely to further limit women from being economically active. Furthermore, women working part-time or remotely through labour platforms fall in the ambit of the informal economy and are unlikely to access social security and labour protection guarantees typically associated with regular formal employment. Women working outside the scope of the platform economy, i.e.

²⁴⁰ Unpaid workers.

in factories and on farms, may not necessarily benefit from digitisation and remote working opportunities without special efforts directed to ease their burden of unpaid work.

4.2/

Current regional disparities will be reproduced, entrenched and even exacerbated with technological adoption.

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The disproportionate focus of investment in education, infrastructure and economy in urban areas, especially Colombo, combined with protracted civil conflict and marginalisation in the Northern and Eastern provinces have created stark regional disparities in language proficiency, digital skills, and access to decent jobs and employment. These conditions are likely to shape the distribution of technology gains across the country. Existing regional disparities are very likely to get reproduced because of the inaccessibility of the digital economy and may also get further entrenched.

The unequal focus on Colombo and the Western province can be traced back to the first wave of liberalisation in the 1970's —with the setting up of EPZ's in Katunayake— when the source of foreign earnings shifted from tea and rubber exports to garments, and subsequently the push for infrastructure projects in and around Colombo.²⁵³ As of 2016, the Western province's share of national GDP was 39.7%, as compared to 4.2% for Northern and 5.7% for Eastern regions.²⁵⁴ Further, infrastructure in these regions lag behind,²⁵⁵ especially in terms of interior roads, transportation, communication and market networks.²⁵⁶

In tandem with low relevance in the national economy and poor infrastructure, access to critical services like education and healthcare are limited in the Northern and

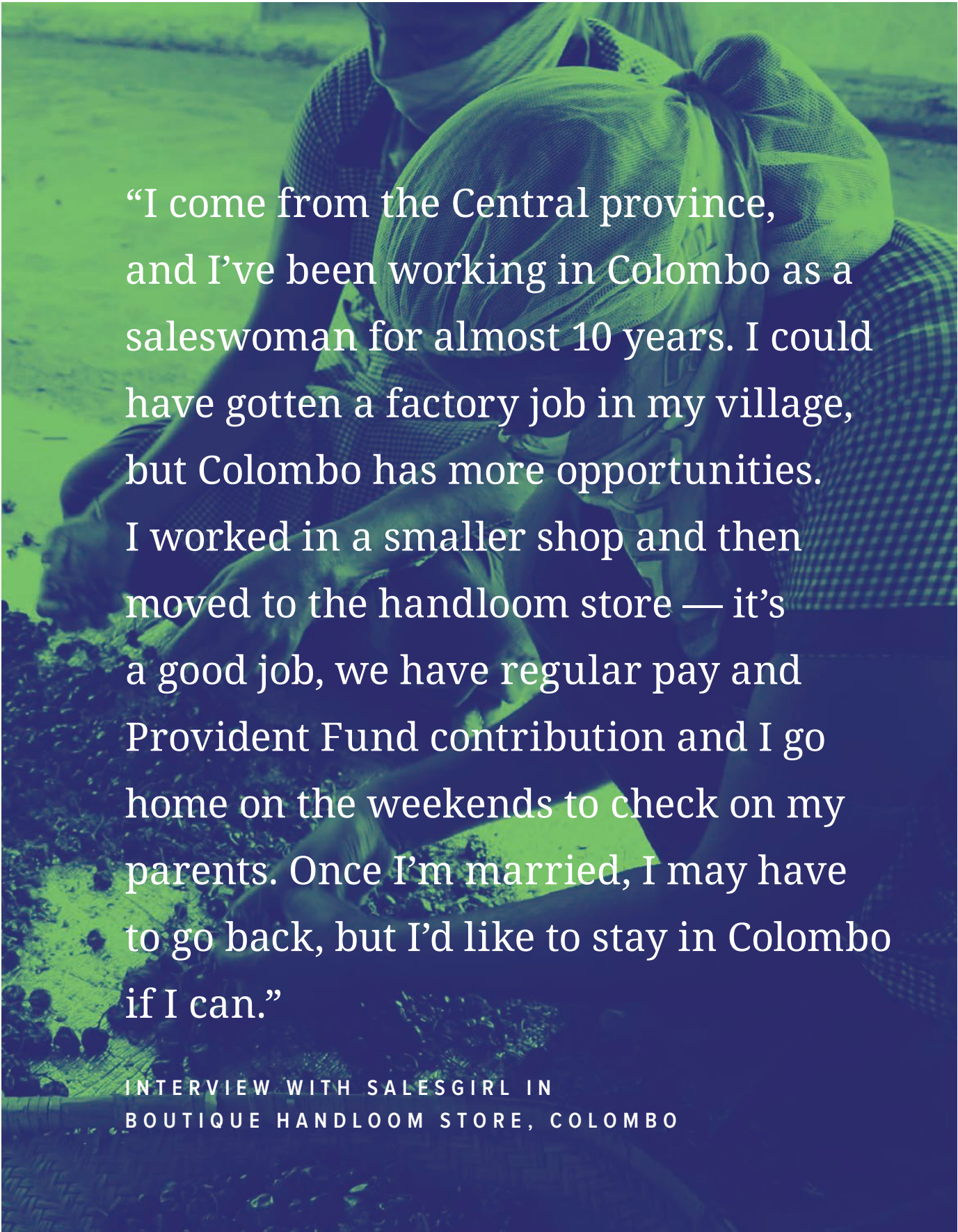
Eastern regions along with Uva — this is seen in the marginalised Vedda community where almost 20% of children do not attend school,²⁵⁷ with poor nutrition and health conditions contributing to irregular attendance.²⁵⁸ The distribution of public investment across rural and national schools is extremely unequal— over 90% of schools are located in the provinces, and receive around 60% of general education spending, as opposed to national schools which make up around 5% of total schools attended by affluent students from urban areas, and receive over 30% of public educational investment.²⁵⁹ This disproportionate focus is reflected in learning outcomes— while the national average dropout rate is 3.9%, it is significantly higher in Northern and Eastern regions at 15.8%.²⁶⁰ Similarly, an NEREC²⁶¹ national assessment of Grade 4 students in 2009 revealed that the mean achievement score in mathematics was 77% in Sinhala medium schools, as opposed to 62% in Tamil medium schools concentrated in Northern and Eastern regions.²⁶²

English and subsequently digital literacy has become a critical factor in accessing employment opportunities in an increasingly global and digital economy.²⁶³ While overall English proficiency in Sri Lanka is low at 22%, there is still a significant disparity between rural and urban areas. English literacy reached 40% of the population in the Western province, while remaining the lowest in North Central, Northern, Eastern regions and Uva.²⁶⁴ Likewise, 71.1% of Sri Lanka's English-literate population is computer-literate, as opposed to 35% Sinhala and 27% Tamil literate populations. Imbalance of technological access displays the same trend, where the lowest rates of computer ownership per household are seen in Uva (9.75%), Eastern (11%), North Central (16.5%), and Northern (18.6%). These factors have resulted in the absence of decent work opportunities in Northern and Eastern economies, where a largely Tamil population

“Over half our freelancers are women — and many of these women haven’t worked outside [the home] for years, because they have to take care of their families and children. Even now, many women freelancers only share that they work with their spouses, the rest of their family would disapprove - so they hide their work.

INTERVIEW WITH OWNER OF
A SRI LANKAN DIGITAL PLATFORM



A woman wearing a checkered shirt is shown from the chest down, working with a large, light-colored sack. She is leaning over, and her hands are visible as she handles the material inside the sack. The background is a textured, light-colored surface, possibly a wall or a large sack. The entire image is overlaid with a semi-transparent blue and green gradient.

“I come from the Central province, and I’ve been working in Colombo as a saleswoman for almost 10 years. I could have gotten a factory job in my village, but Colombo has more opportunities. I worked in a smaller shop and then moved to the handloom store — it’s a good job, we have regular pay and Provident Fund contribution and I go home on the weekends to check on my parents. Once I’m married, I may have to go back, but I’d like to stay in Colombo if I can.”

INTERVIEW WITH SALESGIRL IN
BOUTIQUE HANDLOOM STORE, COLOMBO

depends on agriculture.²⁶⁵ Labour survey data indicates that over 90% of youth in Northern and Eastern regions are predominantly engaged in informal employment,²⁶⁶ with overall informality being significantly higher in the northern region (14% over the national average of 60%).

With existing disparities so entrenched in the current socio-economic and cultural context of Sri Lanka, the northern and eastern regions, along with Uva and Sabaragamuwa, will be relatively slow in engaging with and benefitting from the digital economy and emerging technologies. Young workers are likely to move out of these areas in search for better working opportunities beyond agriculture, to economic hubs such as Kandy and Colombo. The movement of workers from agriculture to services, particularly in wholesale and retail, is likely to decline due to the automation of middle-skilled jobs across services²⁶⁷. These regions are likely to benefit only marginally from digital technologies, while widening regional inequities.

4.3 /

Skilling gaps and language impediment will pose a challenge for workers in accessing decent work and technology gains.

The labour conundrum in Sri Lanka is telling of the current gaps in education, as well as the risks of technological transformation facing the country's future of work. A large section of Sri Lankan youth do not have higher education or skill training — soft skills, digital literacy, and English literacy — ultimately restricting their access to high-level jobs that match their

aspirations. Instead, youth, both educated and not, are at a standstill— equally unwilling to settle for low-skilled, manual jobs even as they are unqualified for the private sector's quickly-evolving work landscape.

As little as 10% of Sri Lanka's population over 19 years old have relevant professional or technical training, while 44% of the working population has not even completed secondary education.²⁶⁸ In fact, only 4% of Sri Lanka's population has completed higher education²⁶⁹, and of the 149,000 students that passed their A-level examinations in 2014-15, approximately 120,000 students were unable to gain admission in state universities.

Youth unemployment is high at 14.7% (compared to the 2014 national average of 4.4%). This trend is further accentuated by declining youth participation in the labour force altogether, including educated youth who are ultimately unprepared for competitive, high-level jobs in the private sector.²⁷⁰ Although comprehensive evidence around graduate unemployment is limited²⁷¹, available data suggests that around 25,000 university graduates between the ages of 15-65 are unemployed. This points to almost one third of university graduates enrolled in art subjects, where the employment rate for arts graduates is dismally low at 32% as opposed to 90% for engineering, ICT and medical students.²⁷²

Due to the inaccessibility of decent work opportunities in the private sector, educated youth depend on public sector employment, with over 77% of college graduates being employed by the public sector.²⁷³ But for those without university qualifications, public sector jobs are out of reach and entry-level, middle-skilled occupations such as retail²⁷⁴ serve as

²⁷⁴ As they signify higher social status.

the pathway of social mobility, especially for rural youth moving out of agriculture and plantation sectors. Yet, even within the service sector, the demand for technical skills and soft skills²⁷⁵ are becoming increasingly high. The Labour Demand Survey revealed that 40% of the employers noted ‘team working’ as a prominently lacking skill, while almost 30% pointed to ‘oral communication’ and ‘taking initiative’ as insufficient.

To a certain extent, digital and internet access will have a democratizing effect. People can access varied learning opportunities, including information around specific jobs and hiring platforms. However, the ability to harness these opportunities remain to a large extent contingent on educational qualifications and English language proficiency.

English language proficiency is a crucial prerequisite for acquiring decent work, particularly in the private sector. Still, English literacy was only prevalent for 22% of the population above 15 years of age.²⁷⁶ Literacy levels were shown to be directly proportional to educational qualifications²⁷⁷, with over 80% of degree holders being English-literate.²⁷⁸ Though initiatives to include regional languages in platforms are underway—e.g. local taxi aggregator PickMe now offers Sinhalese and Tamil options—the increasing affordability of mobile phones and data packages has radically dissolved the barriers to internet access, thus the sheer dominance of English language content continues to restrict critical information and opportunities.

Despite the abundance of blue collar factory work, the youth are more attracted to middle-skilled jobs in sales and retail.²⁷⁹ These jobs face the risks of automation, where the slow

but steady shift to e-commerce platforms threatens the entire ecosystem of brick and mortar retail. In the face of technological adoption and exposure to global markets, skilling and talent requirements are likely to keep evolving over the next decade. Aside from foundational skills, workers will be required to learn and adapt to changing demand in new and unexpected ways. The automation of many middle-skilled tasks is likely to further impede labour mobility for youth moving out of agriculture through mid-level jobs in the service sector.

²⁷⁵ Soft Skills, ILO: Strong communications skills, building positive relationships with stakeholders and showing leadership qualities are, among others, becoming essential skills for workers in science, technology, engineering and mathematic sectors. (Going beyond technical skills: Soft skills matter in the workplace. (2018, October 8). International Labour Organization. Retrieved from [https://www.ilo.org/jakarta/info/public/pr/WCMS_647297/lang-en/index.htm])

²⁷⁶ As of 2012.



“Our company needed more than 500 software engineers, but it was hard to find and train them in time, so we worked on automating these positions. The IT industry has been facing shortages for high-skilled jobs, even though Sri Lanka has a lot of talent — fresh graduates are simply not ready for work.”

INTERVIEW WITH INDUSTRY EXPERT, IT SECTOR

Chapter 5 / Way Forward

Decisive policy action is needed to steer technology trajectories toward decent work. This chapter is organised around two broad themes: Bright Spots and Policy Portfolios.

Bright Spots have been identified in terms of sectors that are not easily automatable or those in which technological innovation can open new avenues for job creation. Policy Portfolios take the form of coping strategies for the Future of Work, with the intent of proposing safety nets that meet employment needs.



Ayesha Dulani is a young female student who has nearly completed her nursing program at a nearby college. She is excited to finally start working in the care economy, as it has always been a dream of hers to work in medicine and help others. Further, she has no anxiety about the job opportunities available to her. There is a great demand for jobs in this industry— from public hospitals to private old age centres. In school, Ayesha recently learned of new medical technology which she is expected to understand and be able to use when it is her time to work. She discovered that the use of Internet of Things in hospitals is growing, and consequently making the patient-doctor relationship more efficient.

Ayesha's interest in these technologies and how they will affect her line of work has rapidly grown, and she finds herself studying overtime in order to prepare herself for the new medical environment she will soon enter. In her research, she learns that IoT allows care workers to keep track of patients in ways that were not possible before— every patient will wear a biometric bracelet that interacts with the other devices around it, including her own work mobile phone through an app especially made for workers in the industry.

5.1 /

Bright Spots

1. The care economy could provide decent work opportunities that are unlikely to be threatened by automation.

Service jobs that require affective labour—labour involving a personal and emotional connection between the service provider and the receiver—are areas of work that are least likely to get entirely automated.²⁸⁰ Specifically in medical, geriatric and childcare industries, human labour will be highly valued in the future. Thus, in Sri Lanka, the care economy could support the workforce for the future.

As of 2017, those aged 55 and above form 20.2% of Sri Lanka's population,²⁸¹ with the country's elderly dependency ratio high at 14.1% in 2015.²⁸² By 2041, a quarter of Sri Lanka's population is expected to be elderly, tipping the dependency ratio²⁸³ further towards the aging.²⁸⁴

Despite Sri Lanka's decent health indicators, existing infrastructure is insufficient to support the needs of an aging population. The National Elderly Health Policy has highlighted long-term elderly care as a priority area, proposing the establishment of at least two elderly care institutions in each province, but this has yet to be implemented.²⁸⁵ World Bank statistics²⁸⁶ highlight that the overwhelming majority of the elderly population is likely to depend on public health services, as opposed to private care.²⁸⁷

There is also a significant workforce shortage in the global health sector, estimated at 7.2 million workers, and this is expected to intensify.²⁸⁸ Currently, around 95% of in-patient care and

50% of out-patient care is provided by the public system, while the private sector accounts for the remaining 5% and 50%, respectively.²⁸⁹ While digitisation and automation can increase productivity in the health sector, technology is likely to augment labour and the delivery of care rather than displace it. Medical assistance technologies are increasingly being used, alongside the digitisation of medical delivery services – with apps such as Sri Lanka's oDoc²⁹⁰ providing professional health services through video chat.

In the absence of formal care for the elderly and the increasing pressure of an aging population, women's domestic burdens will continue to grow, further challenging their access to decent work.²⁹¹ Care work is currently managed informally by women at the household level. Research by the Overseas Development Institute indicates that women take on more than 10 weeks per year for unpaid care work across 66 countries (covering two-thirds of the world's population).²⁹² Women in developing and emerging economies, particularly, feel the weight of this responsibility.

Sri Lanka is experiencing a growing demand for workers in the care economy, which is currently underserved. Formalising and investing in the care economy will not only provide much needed support for the elderly, thus easing women's domestic burden, it will also address critical concerns around Sri Lanka's growing labour shortages, providing much needed decent work opportunities. Care work could also absorb migrant workers returning to Sri Lanka and creating certifications for care workers could also help migrant workers secure semi-skilled jobs abroad. However, as reintegration remains a major challenge for returning migrant workers due to lack of access to

²⁸³ Indicating that dependent elderly population will exceed dependent youth population.

new jobs, advisory services, training and education, and a breakdown of family support systems, sustained efforts are required to address these issues in the form of economic assistance, counselling, and capacity building initiatives.²⁹³

2. Demand for sustainable products and services could generate new employment opportunities.

Consumer awareness is driving a demand for more sustainable products and services in Sri Lanka. New jobs could be created to cater to the transition to cleaner energy systems²⁹⁴ and value-added agricultural products where consumers want a personal connection to farmers, growers and artisans. The strongest potential for sustainability led opportunities lies in agriculture, renewable energy, waste management and tourism; more specifically, organic farmers and artisanal tea growers, solar technicians, resource management specialists, and ecotourism operators.²⁹⁵

Investment in green technology geared towards sustainability, reusability, and resource-efficiency²⁹⁶ can allow for employment creation in the labour-intensive green economy.²⁹⁷ The move towards sustainable employment opportunities should also open up avenues to increase women's participation in the workforce. Areas with a potential for green technologies include alternative fuel sources such as solar and wind energy and green building using sustainable materials.²⁹⁸ ILO's Green Jobs initiative in Sri Lanka combines the twin goals of sustainability and gainful employment, with an emphasis on decent and environmentally friendly jobs²⁹⁹ — the objective being the reduction of energy consumption, waste and limiting greenhouse gas emissions, all while providing fair, non-exploitative work opportunities.³⁰⁰

Sri Lanka has been quick on the uptake of sustainable tourism with green tourism becoming the preferred alternatives to unsustainable luxury experiences.³⁰¹ The Sri Lanka Ecotourism Foundation (SLEF) is working towards connecting various ecotourism actors across the country to promote socio-economic development while also preserving heritage sites and working towards environmental conservation.³⁰² Still, there is a much needed push for climate resilience sustainability efforts in Sri Lanka, with its particular vulnerability to environmental pressures, having topped the Global Climate Risk Index for countries most affected by 'weather related loss events'³⁰³ in 2017.³⁰⁴ This is compounded by political compulsions and lack of integrated planning, management and regulation of the natural resources.³⁰⁵

Apparel manufacturing, one of Sri Lanka's main exports and a major employer, has been flagged for its role in the worsening environmental crisis, contributing to pollution, greenhouse emissions and increasing water consumption³⁰⁶. The 'Garments Without Guilt' campaign, initiated by a number of Sri Lanka's apparel manufacturers, reflects efforts by private corporations towards sustainable production practices.³⁰⁷ While the initiative highlights various employment safeguards and fair labour policies as part of its sustainability drive,³⁰⁸ there is a need for better and more formal implementation of standards.

3. Employment in tourism will continue to be driven by the growth of individual service providers on digital platforms.

With an array of natural and cultural attractions and increasing port activities, Sri Lanka's island economy is perfectly positioned to benefit from the growth of

³⁰³ These include storms, floods, heatwaves, and so on.

³⁰⁸ As outlined by the guiding principles of prohibition of forced labour, prohibition of child labour, prohibition of discrimination. (ibid.)

tourism; in fact, even popular guide Lonely Planet ranks Sri Lanka as the ‘best country to visit in 2019’.³⁰⁹

The tourism industry is one of the major thrust areas under Sri Lanka’s Digital Economy Strategy.³¹⁰ Travel and tourism directly contributed 5.3% to the GDP in 2017, and their share is expected to grow by 5.7% per annum. As of 2017, the industry supports over 850,000 jobs, directly and indirectly, contributing 11% to total employment, and this is projected to grow sustainably by 1.6% per annum, reaching 1,037,000 by 2028.³¹¹

In 2015, some 1.8m tourists visited the country, according to data from the Sri Lanka Tourism Development Authority (SLTDA). This is up nearly 18% on the previous year, and the government has made ambitious plans to accommodate another 4 million visitors by 2020.³¹² As a part of the Sri Lanka Tourism Promotions Bureau’s branding initiative, the government is investing up to \$80m in a global digital marketing campaigns.

While tourism experienced double the growth in the post-conflict period³¹³, stronger growth has occurred in supplementary establishments, comprised of guesthouses, home-stays, rental housing and heritage hotels. The SLTDA estimated that these informal establishments supplied 60% of the 28,000 hotel rooms in 2015. Moreover, this growth in SMEs and own account enterprises can be attributed to the expansion of online and digital platforms such as AirBnb.³¹⁴ Airbnb currently has over 18,000 properties listed across Sri Lanka, and is rapidly growing by over 72% each year. Similarly YohoBeds, a Sri Lankan digital platform and application for travellers, boasts over 3000 independent properties— all targeted at affordable travel.³¹⁵

The formal hotel segment is centered around a few large domestic chains such as John Keells and Jetwing Hotels. Accommodation across

such hotels not only falls short of meeting the increasing tourist demand, it is also predominantly oriented at luxury travel. The progress of the tourism industry through the digital route offers various benefits for both platform and small time property owners, enabling new entrepreneurial possibilities and supporting allied sectors such as transport, especially in rural areas.

Even as the proliferation of rentals on digital platform (Airbnb, YohoBeds) is currently unregulated and falls within the purview of the informal sector, the government is in conversation with digital platforms such as Airbnb to regulate and formalize these establishments. Tourism-led self-employment through digital platforms is also integral as it is likely to create direct and indirect employment in allied industries such as transport, restaurants and so forth. While offering dispersed opportunities for work across Sri Lanka, digital platforms, if regulated effectively, can play a crucial role in decentralising access to work in the tourism sector by enabling small-scale and informal establishments outside the formal hotel industry.

5.2 /

Four Policy Portfolios

Over the next decade, Sri Lanka's growth trajectory will undoubtedly see technologisation across the economy in varying degrees. Sri Lanka's workforce will not be immune to the vast technological shifts underway globally, even if the speed and intensity of their permeation into Sri Lanka's unique socio-economic context occurs differently than other countries. Recent policy stances have specific focus on attracting high-end export-oriented manufacturing and services; FDI; and promoting innovation, entrepreneurship and the digital economy at a national, strategic level.³¹⁶ Policy initiatives like concessionary loan schemes and matching grant schemes have been deployed to enable enterprises upgrade, adopt technology, and improve products and processes³¹⁷. All these dynamics will shape an economy over the next two decades that is more technology-oriented than it is today.

Sri Lanka is thus in need of a portfolio of policies and strategies to gainfully shape the world of work in the country. Policy portfolios have been articulated across four domains. First, **education and skilling** will need to provide lifelong learning opportunities and build capacities for availing opportunities in new sectors and launching entrepreneurial ventures.³¹⁸ Secondly, **technology and innovation** can be used to shape technological trajectories that develop applications to serve those that are the risk of being left behind and accelerate employment generation in new sectors. Thirdly, enhanced **labour protection** will provide new frameworks to better protect workers as the number of contracted, self-

employed workers increase and employment relationships³¹⁹ transform through platformisation of work. Finally, strategies for **redistribution** can ensure technology gains are distributed more widely into society through Government policies and stronger universal safety nets and new forms of employee compensations in firms. The portfolios listed below represent an indicative list for future research and exploration, recognizing that each will pose their unique set of challenges and trade-offs.

1. Education and Skilling

Promote digital skilling programs and strengthen foundational skills. As the ILO (2018) has rightly noted, 'one of the most fundamental challenges to a just jobs transition consists in closing the critical gaps in skills and education requirements that rapid technological change creates', and further, 'traditional education and training systems have to undergo major adjustments to make the most of the evolving world of work'.³²⁰ In the future of a digital economy, there lies a critical window of opportunity for Sri Lankan youth entering the workforce over the next decade. Digital skilling interventions will need to go beyond technical skills to enable adaptiveness among workers,³²¹ but skilling cannot act as a substitute for education. Foundational knowledge for problem solving will be integral to the life-long learnability and adaptive capacity of Sri Lanka's ageing workforce. Soft skills will be progressively relevant; for without the proper foundations of reading, writing, and arithmetic, a future of high-level comprehension of STEM, coding and digital skills cannot be reached.³²²

³¹⁶ The Board of Investment, with the help of the Harvard Center for International Development, has begun identifying new sectors and companies to target investment promotion; the new National Export Strategy (2018-2022), Innovation and Entrepreneurship Strategy (2018-2022), and forthcoming Digital Economy Strategy provide a framework for action to improve competitiveness across the economy.

³¹⁷ 'Enterprise Sri Lanka loan schemes of the Ministry of Finance provide, on average, a 50% interest subsidy for SMEs to invest in new improvements to their business; the 'Market Access Support Scheme' of the Export Development Board provide matching grants for firms to innovate.

Foster education and skilling programs to address regional gaps. There are stark regional disparities in education and skills attainment, as are differences based on ethnicity and language in Sri Lanka. In order to identify and confront education and skilling gaps, targeted policy measures are needed in lagging regions, particularly amongst women and other marginalised groups.

The regional disparities in English language proficiency and digital literacy need social focus. Though an initiative is required to make digital platforms accessible in local languages, there is also a need to enhance English language proficiency, considering the substantial rural-urban gaps.³²³ Similarly, Sri Lanka needs to train teachers in rural provinces to use digital technologies as a tool in teaching — this should be in addition to a national-level adoption of digital literacy throughout the education sector. To accelerate this, partnerships with international organisations would be useful, with recent initiatives by Sarvodaya Fusion (a Sri Lankan technology-inclusion NGO) with CISCO³²⁴ and Microsoft³²⁵ serving as good examples. Further, national campaigns to promote family counselling could help confront existing socio-cultural norms around economic agency, thereby creating learning spaces for women and other marginalised groups who, otherwise, do not have access to traditional centers.

Focus efforts into skilling for jobs in Data Science and Cyber Security. In order to stay competitive in the global economy, professional and technical graduates will be expected to adapt with the development of more advanced IT jobs. Education and skilling should match Sri Lanka's quickly-evolving landscape, where routine jobs in the IT sector are increasingly

facing automation. Such action has been taken in India: the All India Council for Technical Education (AICTE) is revamping technical courses by adding AI, machine learning, robotics, data-crunching, and analysis to syllabi.³²⁶

Sri Lanka should also look at countries like South Korea, Germany, Singapore and Japan — all of which top the “Automation Readiness Index” — to understand how to best focus efforts into anticipatory curriculum reform and lifelong learning and occupational training.³²⁷

2. Technology and Innovation

Implement a Data Governance plan. Collection, storage, sharing and ownership of data needs to be effectively governed to facilitate digital infrastructure.³²⁸ In Sri Lanka, stakeholders have identified substantial gaps in digital consumer and data protection regulations.³²⁹ There are currently no laws that govern data in Sri Lanka, but the Information Communication Technology Agency has efforts underway to pursue a data governance policy ‘based on the adoption of a Data Protection Code of Practice’ and embed that as a regulation under the existing Information Communication Technology Act of 2003.³³⁰

In this direction, Sri Lanka needs to develop contemporary data privacy and sharing laws that enable the digital economy, while keeping with global trends and best practices. This points to the EU's GDPR — ‘General Data Protection Regulations’³³¹ — which monitors cross-border flows of personal data, and imposes restrictions when a receiving country does not have a secure data protection framework.³³²

³³⁰ The TIFAC report defines LLL as ‘the processes of re-skilling and re-education that takes place after and beyond formal education and will not include those returning to formal education after taking a break for reasons of choice or compulsion.’ (Technology Information, Forecasting and Assessment Council. (2017). Technology Roadmap: Education [Publication]. New Delhi: TIFAC.)

Support Mission-Oriented Innovation. Mission-oriented innovation³³³ can use public policies to support solution-building for the challenges facing Sri Lanka's enterprises. Through grants, innovation vouchers, and R&D subsidies, Sri Lanka can strengthen and promote technology companies that develop commercially-viable solutions and employment. For example, the government can support R&D in green technology industries, as well as firm and household-level adoption of clean technology e.g. concessionary loans for solar installation, subsidies for in-house affluent treatment, etc. This will drive entirely new economic activity in green industries, where the need for new occupations and jobs will then arise.

Likewise, the government's push to promote rooftop solar in homes and industries³³⁴ has spurred a new industry of solar panel manufacturing and installation in Sri Lanka, providing new technical job opportunities for youth. An online search for 'solar panel installation companies in Sri Lanka' reveals over 20 enterprises in the Colombo metro-area alone. The government can announce 'grand challenges' around climate change adaptation, healthcare, agriculture, ageing population, etc., to motivate entrepreneurial ventures aimed at empowering these sectors.

Encourage Technology Adoption and Spurring Entrepreneurship. Technology adoption and automation could help generate new opportunities for employ-ing displaced labour as it addresses labour shortages, resulting loss of competitiveness, and other areas where work is labourious and no longer attractive for youth e.g. agriculture, estate plantations.³³⁵

In the private sector, the government should encourage the adoption of new technologies and promote their widespread usage by, for instance, targeted grants for enterprise innovation, reduction of border taxes for technology imports, liberalizing digital payments and encouraging API integration. More broadly, promoting information and market platforms, for workers, entrepreneurs,

farmers, would encourage tech adoption and spur new forms of entrepreneurship.³³⁶

There is currently limited discussion about adopting AI at a national level; however, the IT industry has taken some initiatives in this regard. Last year, the IT industry body SLASSCOM held the first national conference on AI – the 'AI Asia Summit'.³³⁷ Moreover, a flagship data science training programme has been newly launched at the University of Colombo's Computing Faculty.³³⁸

3. Labour Protection

Revise Labour Protection plans. Technological developments are likely to lead to new business models e.g. non-standard forms of work, which will require labour protection and a revision of working conditions. In addition, digital technologies can potentially offer workers a virtual space for information sharing, grievance redressal, and new ways of collective bargaining; thus allowing the platform economy to provide opportunities in formalizing the unorganised and informal sector in Sri Lanka.

New forms of collectivising and avenues to promote collective bargaining are also made possible through social media, especially for groups like drivers in location-based work. Alongside this, there would be a need of capacity building for employers' organisations and unions on subjects relevant to technology and future of work.

Global decline in the strength of workers' organisations and collective bargaining will be a major factor contributing to rising inequality. Public policies must work towards addressing this by promoting collective representation and social dialogue - this will work towards the subversion of the dominance of larger economic enterprises in determining economic policy. Labour protection laws need to be revised and re-established with worker needs at the forefront.³³⁹

Regulate the platform economy. As the platform economy in Sri Lanka grows, so will employment opportunities, particularly in informal work but also as new forms of social mobility for educated youth in urban areas. This, in turn, would facilitate a degree of formality for platform workers through registration and use of formal banking.

However, platforms can also lead to the dismantling of traditional employer-employee relations and the dissolution of workers' rights. Along these lines, constant and reflexive regulation of the platform economy will be mandatory, along with the exploration of new, collaborative platform models with a focus on worker welfare.

Such initiatives can be seen in the Motor Vehicles Bill in India, which proposed an amendment to Section 93 of the Motor Vehicles Act of 1988 to enforce licensing for ride-sharing platforms like Ola and Uber, as well as state-defined rates and guidelines.³⁴⁰ Loconomics and Stocksy are other examples of co-operative models for worker and state-owned platforms, where value that is created is treated as a public good.³⁴¹

It is important to look separately at location-based platforms (like ride-sharing, food delivery services, and e-commerce) which can comply with local laws, versus web-based platforms (like remote freelancing work) which may adhere to international practices, based on the location of the employer. To govern such web-based digital labour, Sri Lanka will have to adopt global initiatives to establish transnational policies.

4. Redistribution

Strengthen social security provisions. As the platform economy forges new employment relationships, regular work is being replaced by new forms of self-employment and contractual work. Social security policies — e.g. access to healthcare, pension, unemployment insurance, and maternity leave — therefore need to adapt to this changing environment.³⁴² ILO proposes that countries should initiate minimum social security guarantees nationally, especially as the world of work undergoes tech-driven transformations.³⁴³

In Sri Lanka, there is no universal unemployment insurance. Stakeholders should consider an unemployment fund that supports workers temporarily when they are out of work or looking for work on account of technological disruption. This is seen in EU policies that provide special protection to platform economy workers, in lieu of administrative provisions for part-time, fixed-term and agency workers.³⁴⁴

Through cash-transfer and work-guarantee programs for the informal sector and those engaged in subsistence farming, social security plans can assure basic income security — Sri Lanka can look at India's Mahatma Gandhi National Rural Employment Guarantee and other programmes as enacted in South Africa for model assessment.³⁴⁵

Redistribute Technology Gains. The benefits of technology-driven growth will accrue more to capital than to labour — hitting mid-level jobs like retail and accounting the most. This needs to be addressed through both traditional and novel redistributive methods. There are several global discussions surrounding redistribution

³⁴¹ Soorya Bala Sangramaya (or the 'Battle for Solar Power') by the Sustainable Energy Authority promotes setting up of small solar plants on rooftops of households, hotels, industries, religious places, etc., to add 200MW of electricity to the grid by 2020 and 1000MW by 2025. Net metering and net accounting have been introduced, and banks have been provide refinanced loan schemes to grant loans on concessionary terms. Retrieved from www.energy.gov.lk/Solar/

³⁴³ Under the forthcoming 'Digital Economy Strategy', there proposed flagship projects for the agriculture sector is to set up an online marketplace connecting rural farmers directly with consumers.

of technology gains that Sri Lanka can draw from.

While tech giants like Bill Gates³⁴⁶ propose a ‘robot tax’ - a tax that recognises robots as ‘electronic persons’, the EU rejected this policy to tax robots as a worker would be taxed.³⁴⁷ The draft motion in EU parliament argues that, for tax purposes, organisations should declare savings made in social security contributions by utilising robotics.³⁴⁸

Another proposal is that of the Vice Chairman of India’s NITI Aayog: a ‘labour utilisation fund’ could encourage skilling and hiring practices by providing labour subsidies to firms.³⁴⁹ France, on the other hand, introduced a framework in which firms contribute to state unemployment and social security funds, thus holding them fiscally accountable for firing workers.³⁵⁰

Subsidised employment and the method of providing credit can be used to further incentivise employees to hire unemployed workers and create jobs.³⁵¹ Similarly, broad-based and inclusive versions of Employee Stock Option Plans can create redistributive frameworks at a firm level, as can newer developments in firm ownership such as ‘Employee Ownership Trusts’.

The notion of a Universal Basic Income is also being debated in policy discussions around technology and the future of work as a way to aid workers when job protection becomes too difficult — this could be considered per national fiscal realities.³⁵²

Left to market forces alone, technology trajectories are unlikely to be able to deliver decent work for all. On the contrary, there is a risk that they will exacerbate existing labour market inequities. The policy portfolios presented here, while only a starting point for further enquiry and discussion, will be needed to steer work and technology strategies in Sri Lanka towards equitable and inclusive outcomes.

Annex 1

All major actors, including government agencies, established industries, start-ups, international organisations, research organisations and trade unions were engaged as key informants in the study.

Government

1	Department of Manpower and Employment	The Department of Manpower and Employment, a part of the apex Ministry of Labour and Trade Union Relations, was established with the objective of producing strong professionals for the development of the human resources of Sri Lanka.
2	Department of National Planning	The Department of National Planning is a part of the apex Ministry of National Policies and Economic Affairs, committed to policy development, planning, and implementation to accelerate Sri Lanka's economic growth and social progress.
3	Information and Communication Technology Agency of Sri Lanka	The Information and Communication Technology Agency of Sri Lanka Limited (ICTA) is a company owned by the Government of Sri Lanka, established to develop the economy of Sri Lanka through information and communication technologies.
4	Ministry of Labour and Trade Union Relations	The Ministry of Labour and Trade Union Relations works to contribute towards the socio-economic development of Sri Lanka through the promotion of industrial peace and harmony, social protection, rights at work and productivity.
5	National Enterprise Development Authority	The National Enterprise Development Authority (NEDA) promotes, supports, encourages and facilitates Enterprise Development within Sri Lanka with special emphasis on the Micro, Small and Medium Enterprise (MSME) sectors of the country.
6	Prime Minister's Office	The Prime Minister's Office is a ministry of the Government of Sri Lanka. It provides the administrative and institutional framework for the exercise of the duties and responsibilities vested in the Prime Minister of Sri Lanka.
7	Sri Lanka Export Development Board	The Sri Lanka Export Development Board (SLEDB) is the premier state organisation for the promotion and development of exports.

Academics and Think Tanks

8	Centre for Poverty Analysis	CEPA is an independent, Sri Lankan think-tank promoting a better understanding of poverty-related development issues.
9	Citra Innovation Lab	Citra is Sri Lanka's first Social Innovation Lab established as a joint initiative between the Ministry of Science, Technology & Research, and the United Nations Development Programme (UNDP), Sri Lanka. It uses foresight and innovation tools to prototype and test development solutions to ensure they are agile and holistic before nation-wide implementation.
10	Faculty of Graduate Studies, University of Colombo	Faculty of Graduate Studies (FGS) is one of seven faculties of the University of Colombo. The largest graduate school in the country, it conducts post-graduate degree programs in many fields, via on campus lectures and distance learning.

11	Faculty of Nursing, University of Colombo	Faculty of Nursing, University of Colombo, is the first ever nursing faculty in Sri Lanka. The overall aim of Faculty of Nursing is to enhance Sri Lanka's capacity to produce graduate nurses who are capable of catering for both national and international health care needs with advanced knowledge and skills which are based on a sound theoretical and practical foundation.
12	Institute of Policy Studies	The Institute of Policy Studies of Sri Lanka (IPS) is an autonomous institution that aims to contribute to socio-economic development through high quality, policy-oriented economic research.
13	International Centre for Ethnic Studies	The International Centre for Ethnic Studies (ICES) is one of the Sri Lanka's leading research centres, focusing on ethnicity, identity politics, conflict and conflict resolution, post-war reconstruction, democracy and governance, human rights, development and gender.
14	Lakshman Kadirgamar Institute	The Lakshman Kadirgamar Institute (LKI) is a think tank focusing on Sri Lanka's international relations and strategic interests, to provide insights and recommendations that advance justice, peace, prosperity, and sustainability.
15	LIRNEAsia	LIRNEAsia is a pro-poor, pro-market think tank. They are in favor of decentralized innovation – including through competitive markets – to enhance the lives of the poor.
16	University of California, Los Angeles	The University of California, Los Angeles is a public research university in Los Angeles. UCLA advances knowledge, addresses pressing societal needs and creates a university enriched by diverse perspectives where all individuals can flourish.
17	University of Peradeniya	The University of Peradeniya is a state university in Sri Lanka, funded by the University Grants Commission. It was established as the University of Ceylon in 1942.
18	Verité Research	Verité Research is a private think tank that provides strategic analysis for Asia. Its main research divisions are economics, politics, law and media.
19	Women's Studies, University of Colombo	The Gender and Women's Studies department of the University of Colombo recognizes the inception and history of feminist theory and women's studies while also incorporating the current developments in the academic field of gender studies.

UN Agencies and Multilateral Banks

20	Asian Development Bank	The Asian Development Bank (ADB) is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. It assists its members and partners by providing loans, technical assistance, grants, and equity investments to promote social and economic development.
21	Food and Agriculture Organization	The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger.
22	International Finance Corporation	IFC is a sister organization of the World Bank and member of the World Bank Group which is the largest global development institution focused exclusively on the private sector in developing countries.
23	International Organization for Migration	IOM is the leading inter-governmental organization in the field of migration and works closely with governmental, intergovernmental and non-governmental partners. IOM is dedicated to promoting humane and orderly migration for the benefit of all.
24	United Nations Development Programme	UNDP works to eradicate poverty while protecting the planet. They help countries develop strong policies, skills, partnerships and institutions so they can sustain their progress.

25	UN - Habitat	The United Nations Human Settlements Programme is the United Nations agency for human settlements and sustainable urban development.
26	United Nations High Commissioner for Refugees	The Office of the United Nations High Commissioner for Refugees is a United Nations programme with the mandate to protect refugees, forcibly displaced communities and stateless people, and assist in their voluntary repatriation, local integration or resettlement to a third country.
27	United Nations International Children's Emergency Fund	UNICEF works in 190 countries and territories to save children's lives, to defend their rights, and to help them fulfil their potential, from early childhood through adolescence.
28	United Nations Population Fund	UNFPA is the United Nations sexual and reproductive health agency.
29	World Bank	The World Bank is an international financial institution that provides loans to countries of the world for capital projects.
30	World Food Programme	The World Food Programme is the food-assistance branch of the United Nations and the world's largest humanitarian organization addressing hunger and promoting food security.

Private Sector

31	BOV Capital	BOV Capital is a Venture Capital Firm based in Sri Lanka and Singapore. It was established to help Sri Lankan startups capture regional and global opportunities.
32	Dialog Axiata Group	Dialog Axiata PLC is one of Sri Lanka's largest telecommunications service provider with the country's largest mobile network operator of over 13 million subscribers.
33	Employers Federation of Ceylon	The Employers Federation of Ceylon (EFC) is the principal organisation of employers dealing with labour and social issues in Sri Lanka.
34	ExpoLanka	Expolanka Holdings is a global diversified conglomerate rooted in Sri Lanka. The group specializes in logistics, leisure and investments.
35	Flintec	Flintec is a world leading manufacturer of high quality, precision, weight measurement technologies for use across a diverse range of industrial sectors.
36	Hayleys	Hayleys PLC is the leading conglomerate in Sri Lanka with a 140 year heritage and diversified subsidiaries focused on all aspects of business and investment.
37	Intelligent Image Management	IIM helps organizations of all types and sizes transform their data into information and knowledge, driving insight and action.
38	London Stock Exchange Group	London Stock Exchange Group PLC is a British-based stock exchange and financial information company.
39	MAS Holdings	MAS manages a portfolio of businesses with a revenue of over USD 1 billion and is positioned as one of the world's most recognised design to delivery solution providers in the realm of the apparel and textile manufacturing.
40	National Chamber of Exporters of Sri Lanka	National Chamber of Exporters of Sri Lanka (NCE) is one of the leading business chambers in Sri Lanka which exclusively serves Sri Lankan exporters.
41	NeilMarine	Neil Fernando and Co.(Pvt.) Ltd which is part of the Penthouse Group of Companies is the Leading FiberGlass Boat Builder in South Asia with over 48 Years of experience.

42	Simplex Delivery	With 30 fulfillment centers in operation covering the whole of Sri Lanka, catering to over 270 businesses, Simplex has come a long way in a very short time, renowned for its dependability, integrity, and spirit for innovation.
43	Takas.lk	Takas.lk was established with the purpose of providing a world class online portal for ecommerce in Sri Lanka.
44	WSO2	WSO2 is an open-source technology provider founded in 2006. It offers an enterprise platform for integrating application programming interfaces, applications, and web services locally and across the Internet.
45	YoHo Beds	As the first branded network of budget hotels in Sri Lanka, Yoho Bed has revolutionised the hospitality industry by giving people access to essential holiday amenities.

Startups

46	Conscient AI	An artificial intelligence (AI) technology company that focuses on applying machine learning and deep learning to solve problems in multiple domains.
47	LiveRoom	LiveRoom is a company providing specialized research and development solutions for upcoming and emerging domains in the computer graphics industry such as AR, VR, Computer vision Digital human etc.
48	LinearSquared	Linear Squared strives to deliver unique solutions to complex business problems by integrating Machine Learning and Artificial Intelligence with domain expertise and cutting-edge technology.
49	ODoc	oDoc is an app which connects clients with doctors for video and audio consultations over a phone. It allows the client to channel SLMC registered doctors, obtain medical advice, receive a prescription (if medically required) and get their medication delivered.
50	PodiJobs/SecondTeam	The first freelance platform in Sri Lanka which bridges the gap between employers and job seekers.
51	ReadMe	ReadMe is a source covering everything that happens in the Sri Lankan IT industry. They bring the latest news, insights and unparalleled features into the Sri Lankan techscape.
52	ROAR Media	Roar Media is a new media platform that offers coverage and analysis of current affairs, business, lifestyle, technology, arts, and culture in South Asia, across five languages.
53	Universal Robots	Universal Robots believe that collaborative robotic technology can be used to benefit all aspects of task-based businesses – no matter what their size. Their robot arms are advanced tools that can be used by all levels of production staff to help increase productivity, reduce injury, and boost morale.

Trade Unions

54	Ceylon Federation of Trade Unions	The Ceylon Trade Union Federation (abbreviated CTUF) is a national trade union centre in Sri Lanka.
55	Ceylon Workers Congress	The Ceylon Workers' Congress is a political party and a trade union in Sri Lanka that has traditionally represented Sri Lankan Tamils of Indian origin working in the plantation sector of the economy.
56	Free Trade Zone & General Services Employees Union	The FTZGSEU is a formal collective bargaining agent for workers in the Free Trade Zones.
57	National Trade Union Federation	The NTUF, founded in 2003 in Colombo, is a national level Trade Union Federation in Sri Lanka representing and safeguarding the rights and interests of all sectors of the working population of Sri Lanka.
58	Sri Lanka Nidahas Sevaka Sangamaya	SLNSS is a trade union formerly affiliated with the Sri Lanka Freedom party.

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