



**Asia-Pacific
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The Future of Women at Work: Empowering Women's Role in the Transition Era of Automation

APEC Policy Partnership on Women and the Economy

June 2022



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Workshop Summary Report

APEC Policy Partnership on Women and the Economy

June 2022

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I. Introduction of the Project

Due to the Covid-19 pandemic, the two-day workshop was held from 8-9 December 2021, in a hybrid mode. This workshop covered four main issues, which are: 1) providing knowledge of the APEC Agenda on Women Economic Empowerment in the Era of Automation; 2) providing knowledge of women's role in automation in the industry; 3) elaborating public sector's role in designing the effective and efficient policy framework to empower women in the transition era of automation; (4) sharing experiences from the developed economy about the subject of women's role in the transition era of automation and providing recommendations for APEC's program on accelerating women's empowerment and leadership through the digital economy.

II. Objectives of the Meetings

The main objective of this workshop is to generate the most efficient and effective policies on women empowerment to guarantee the participation of women in a formal job in the era of automation. Considering the era of automation, women need to improve themselves to transform their works into higher-skilled jobs, or they will face a growing wage gap. Due to the Covid -19 pandemic, the committee was unable to hold physical meetings, and it was converted to a hybrid meeting instead.

The meetings were held in a hybrid mode for two days through the Zoom Virtual Meetings platform. Speakers and participants were gathered in that platform with two sessions of discussion each in a day. The meetings were held successfully. Participants had actively involved in the discussion and questions answers sessions with the speakers.

III. Briefings of the Presentations in the Workshop

The speakers came from different backgrounds of expertise, such as Government representatives, Academician, and Business Representatives. This two-day workshop was opened by a keynote speech from the Minister of Women Empowerment and Child Protection, Republic of Indonesia, Ms I Gusti Ayu Bintang Darmawati. There were four sessions of presentation and discussion from the speakers.

- **Opening remarks**

In the workplace, Covid-19 changes the way we interact and work with machines and people. The impact of automation on women may vary, depending on their adaptability. When they can adapt, they will be more productive and get a better job, or the gap will be wider between women and men.

Women need to have higher education and skill to be successful in a transition era of automation. Women need to advance their skill, mobile, and task savvy to overcome the disruption and adapt to the new world of works.

Work flexibility has positive and negative effects on women and girls in the gig economy. It requires them to be able to work anywhere and anytime and it can bring a negative impact on work-life balance. Working mothers can be overburdened because they must be in professional life careers, parenting, and household matters at the same time. So, we must ensure with all the ease of automation, the work-life balance still can be achieved instead of work-life blurry.

It is expected that the policymakers and relevant stakeholders can come up with policy recommendations, which can strengthen the future of women`s role in the workplace.

- **Session 1:**

Moderator: Dzulfian Syafrian - Economist at the Institute for Development of Economic and Finance (INDEF)

In the first session, the moderator introduced the speakers who would give a presentation in the session. In general, the first session aimed to provide knowledge of APEC Agenda on Women Economic Empowerment in the Era of Automation.

Overview of APEC Agenda on Women Economic Empowerment in the Era of Automation

Lenny N Rosalin - Deputy Minister for Gender Equality Ministry of Women Empowerment and Child Protection of the Republic of Indonesia

- Indonesia has a 270.2 million population, of which 135 million of them are women. Around 53.5% of them are in the productive ages, which become an engine of economic growth. However, we face development challenges in the form gender

gap. It has closed 68.8% of its overall gender gap and globally taken a rank of 101.

- Women tend to participate less in the labor market and have lower wages than men.
- Women are almost left behind in all parts of the world, particularly in APEC economies. The average value of women labor force participation rate is 57.6 in 2019. Women face multiple challenges due to severe health, economic, and social impact due to Covid-19.
- The digital economy is opportunities with borderless, operating, and inclusive actors. The study shows that the value of the Indonesian digital economy will be USD 127 billion in 2025. Indonesia is ready to embrace the digital economy. Most of the companies in Indonesia cope to digitalization in response to Covid-19.
- The gender gap will be a challenge, where women are paid less than men, and they are more vulnerable to digitalization.
- Most of Indonesian women are involved in SMEs, which have a great contribution to the Indonesian economy. Study shows by scaling up 168 thousand SMEs using digital adoption will create additional GDP of USD 140 billion and add about 26 million people to the workforce. In fact, there is only 13% of SMEs that are formed on the digital platforms.
- Women vulnerable are to digitalization. Some of them lose their jobs due to automation, while the remaining jobs are left for those who have high skilled, and techno prepared.
- There are four identified sectors that will get a great impact from automation, which are healthcare, manufacturing, construction, and retails. Meanwhile, women tend to be concentrated in healthcare, manufacturing, and retails.
- Policy responses to prepare women facing automation including:
 - Encouraging women to study and work in STEM
 - Strengthening digital literacy for women
 - ICT Infrastructure development in both urban and rural areas
- Indonesia 5 Priority Programs for Women and Children 2020-2024
 - Increasing women's economic empowerment through gender responsive entrepreneurship
 - Increasing roles of mother and family in childcare and education

- Eliminating violence against women and children
- Combating child labors
- Preventing child marriage
- Women Economic Empowerment Program in Indonesia:
 - Making gender as a central issue in the *Strategi Nasional Keuangan Inklusif* (SNKI) or Domestic Strategy of Financial Inclusion.
 - Support women-owned MSMEs to implement coping strategies from Covid-19 by adopting digital technology and product diversification.
 - Collaborate with all parties, i.e. ministries, local government, private sectors, development partners, academia, and NGOs to conduct a series of gender-sensitive entrepreneurship training and business coaching to increase women’s business skills, digital and financial literacy.
 - Support access to low interest rate credit for women owned MSMEs.

Preliminary Study Presentation “The Future of Women at Work: Empowering Women’s Role in the Transition Era of Automation”

Presentation by Dwini Handayani – Lecturer, Faculty of Economics and Business Universitas Indonesia

- More than half of women in Indonesia’s labor force are low education. Data shows that Women’s labor force with high education level is higher than men.
- The labour participation rate of women in Indonesia is stagnant, which is about 50%, and will increase only 3% in 30 years. The marriage status becomes the main push factor for women entering the labor market. Pandemic makes women actively involved in the labour market because some of their spouse were displaced, and they need to take part to fulfill their household needs.
- Women contribution on labour force in Indonesia is relatively high. Nusa Tenggara Timur, Daerah Istimewa Yogyakarta, Bali, DKI Jakarta, and Sumatera Barat has the highest women’s labor force participation.
- Women`s decisions entering the labour market can’t be separated from culture and norms. Women negotiate their roles at home and at work, where at home is the primary career for them while at work women must face job segregation.

There is a perception that women are better at supporting roles while men are better at being leaders.

- The use of the internet for women in a formal sector is still relatively low, and the potential of a job lost and gained for women by 2030 is less compared to men. The highest job losses will be in service sectors and machine operators and craft workers. Meanwhile, the biggest opportunities for job gains will be in the healthcare and manufacturing sectors.
- There is prominent progress for women where the rate of unemployment is significantly declined, and signal for progressive growth of women roles in the workplace by embracing the digital transformation.
- Women in some major economies in the APEC region are facing automation risk, where some of the job types are taken by women, such as admin & support service and retail trade, cashiers, secretaries, and bookkeeping clerks, which are at a high average risk of automation.
- Automation is reshaping women's jobs with strong resiliency and adaptive strategy sectors and a high risk of automation that could strive to develop their business into another added value. Opportunities for women striving during the pandemic are surging. Some companies like Gojek have been opening new opportunities for women to get paid by dint of the automation development.
- Some actions to improve skills development, create new opportunities in the high-tech world, and improve job quality and job income security, including Expand access to affordable postsecondary education and training; Enhance skill development; Increase access to on-the-job training; Prepare for expected jobs losses in female-dominated jobs; Support women's digital entrepreneurship; Improve the earnings of women; Provide opportunities for workers to participate of technological changes at their workplaces; and Encourage the development of new technologies that work with people.
- Some Policies to Support Women Work in the Transition Era, including The Policy Partnership on Women and the Economy (PPWE); Women in the Economy Forum (WEF); The La Serena Roadmap for Women and Inclusive Growth (2019-2030); and The Women and the Economy Dashboard.

- **Session 2:**

Moderator: Dzulfian Syafrian - Economist at the Institute for Development of Economic and Finance (INDEF)

This session aimed to give a thorough understanding and provide knowledge of women`s role in automation in the industry. The impact of automation for women workers in the future is either they succeed to transform their works into a higher-skilled job, or they face a growing wage gap.

Women and Automation in the Industry: How Artificial Intelligence is Changing the Industry?

Presentation by Didit Dwianto – Head of Engineering of Siklus Refill

- The current situation in automation is on the hardware and software side. It means that the world of automation will be larger and more knowledge need to be given at the university/high education level.
- Covid-19 makes customer demand increases in the digital platform. There are a lot of technology implementations and innovations during the pandemic. Thus, a company needs to automate several things and do artificial intelligence.
- The top five of the most powerful tech companies in the world only have 34,4% of women in the workforce (McKinsey & Co, 2019). Women representation is lagging in several economies, including Indonesia. The senior and managerial level is only a few that taken by women. But overall, the representation is growing from 25,9% in 2018, 26,2% in 2019 to 28,8% in 2020 (AnitaB.org, 2020). The growth of representation of women in technology is 4,96% per year. It would still take 12 years to reach equal representation.
- Women in engineering roles need specific skills. Programming language is required in the labor force. Meanwhile, it was not taught at the universities. In software engineering, jobs are equally available for both women and men. However, only a few women are willing to enter software engineering job because they think it is too technical.
- Siklus provides refills of household necessities without producing any single-use plastic waste with 10-20% cheaper than traditional retails. This idea comes up with the condition of the huge number of plastics waste and the condition of

plastic waste management in Indonesia. Siklus provides a business model to refill household needs without creating more waste. Customers make an order, and then the courier comes to the customer and refills their household needs.

- Technology plays an essential role. Siklus creates an application, backend, and IT system on the software side. On the hardware side, Siklus also plans to keep innovating from manual to automatic dispensers to make the refill become faster.
- The next big thing for Siklus is to do AI and machine learning for retail, such as demand prediction, price formation, logistics, merchandising, personalized offers, fraud detection, churn prediction, location, optimization, sentiment analysis, and document work automation.
- Women in Siklus reach 38,5% with some of them in technical jobs like business intelligence, manual and automation QA engineer, QA engineer, and junior frontend engineer. Siklus also hires women for delivery services.

Presentation by Phu Huynh - Technical Specialist on Employment and Decent Work, ILO Regional Office for Asia and Pacific

- Women at high-risk of automation yet less prepared to gain, because women disproportionately in high-risk occupations; Gender-based sectoral segregation; Disparities in training and gaps in future-ready skills; Inclusive framework to support adjustments to automation.
- The range of jobs exposed to automation risk has certain characteristics. Type of repetitive task is highly risk replaced by automation. The task that is more dynamic and more human interaction is at low risk of being replaced by automation.
- The phase and scope of technology will vary broadly in every economy. It is related to different factors in each economy, such as wage and skill levels; demographic and labour supply, technological feasibility and accosts; and policies and regulations.
- Women tend to work at a greater risk of automation.. The sturdy result by ILP reveals that the probability of women in occupations at high risk of automation (relative to men) in Indonesia is 1.2 times higher than men while the Philippines is 2.4, Thailand 1.5, and Viet Nam is 2.3.

- Sectoral segregation in 16 APEC economies for women share in different sectors in 2020 shows that women across all sectors are take-into-account for 40-45% of total employment, but the concentration for each sector is different. The high sectors for women are in human health and social work and retail and wholesale trade meanwhile the lowest is in construction sectors. For manufacturing sectors tend to be balanced.
- ICT infrastructure gaps leave some women behind because of the geographical conditions and lower access to the internet. Tertiary students enrolled in STEM in APEC economies have shown a huge gap between women and men.
- There are elements of a supportive framework for the future of women at work. They are Enhancing access to gender-responsive education, training, and employment services, Promoting digital and soft skills development and STEM-related career tracks, Investing in social protection, including income support during transitions, and Recognizing, valuing, and redistributing unpaid care work.

The Disproportionate Impact of Automation on Women's work.

Presentation by Prasideya Ilvan Yahdi - Head HRBP Finance and HR Strategy and Transformation Lead of Unilever Indonesia

- Automation will use minimum human input. Three automation technology are: Artificial Intelligence, Mobile robotics, and Machine learning.
- Some examples of global automation trend insight using machine learning are machine learning disrupting the beauty industry, telecommunication and technology provided, and industrial processes with automation machines.
- The automation in manufacturing at the level of a factory is really important because it needs to automate every single piece they do, ranging from small pieces to big machinery.
- Specific to the consumers of goods and retail industry, there is a new reality of automation for companies that face margin and cost pressure due to a hypercompetitive environment. A company needs to improve its performance by improving its speed and ways of working. Automation makes complicated works become streamlined and increase productivity.

- In the consumers of goods and retail industry, technical job that needs specific skills, like STEM and data science is still needed, but the job with physical and routine characteristics will possibly be automated.
- In the goods and retail industries, automation is used in every division. It is needed as a key decision of assortment, pricing, and promotion. It is also useful for the sales division to create salesforce-deployment plans. Moreover, the R&D division will need automation to create innovation and product development. The Supply Chain Division will use it for the operations. Besides, automation will enable access to real-time data in the global sales systems and dynamically match demand with the optimal supply. Automation is also applied in the form of software, which can perform redundant tasks efficiently and accurately in finance, legal, and other back-office functions.
- With automation, more jobs will be created than are lost. By 2030, there will be 23 million new jobs created. Automation trend in Indonesia is happening now, such as online transportation & delivery, e-commerce, online education, etc. The sectors that will be benefited from automation are healthcare, construction, manufacturing, and retail.
- The key issue is there is still a lack of women graduating for the high-demand field, so they don't have the required skills. Moreover, women have smaller networks than men, which could impact their ability to become aware of and capitalize on new employment opportunities. Fewer than 20% of tech workers are female in many mature economies.
- Women are underrepresented in industries that utilize science, technology, engineering, and mathematics (STEM) skills and are based largely on the high number of women employed in clerical occupations. Race and ethnic background can be factors that hinder women to access to training and employment.
- We need hand in hand cooperation between government, industry, and the women itself, all stakeholders related to support skill-building efforts, such as training and reskilling programs for women returning to the workforce, childcare subsidies, and digital learning platform; Address labor mobility constraints, such

as balancing paid and unpaid care, access to the network, reduce stereotypes on gendered occupations; and increases representation in access to technology, such as a pathway for women in technical skills, access to basic technology, digital literacy, and funding for women entrepreneurs.

- **Day 2**

- **Session 3:**

Moderator: Fauziah Rizki Yuniarti – Lecturer in Economics Department, Universitas Indonesia

This session aimed to elaborate public sector's role in designing an effective and efficient policy framework to empower women in the transition era of automation.

The Disruption and Adaptation: How Women Transform the Disruption into Opportunity.

Presentation by Moorissa Tjokro – Expert Engineer in the Autonomous Driving Industry

- The digital revolution began with the third industrial revolution in the mid-1900s. The digital era is characterized by technology that increases the speed and breadth of knowledge adoption within the economy and society. In this digital age, automation allows people to work more efficiently and bring more value to the economy.
- Technology is all around us and has changed our daily lives from the simplest to the most complex. Today, companies have also realized that they rely heavily on data to make decisions and generate more value. Based on Deloitte, Analytics Advantage Survey (2019):
 - 49% of respondents said analytics helps them make better decisions.
 - 16% of respondents said analytics enables key strategic initiatives within the business, and
 - 10% of respondents said analytics help them improve relationships with customers, business partners, and other stakeholders.

- Technology accelerates human capacity to be more useful and efficient, and to create more meaningful values.
- The digital revolution has both positive and negative sides, just like two sides of a coin. Benefits of transitioning into the digital era includes connectivity, communication speed and versatile working, portable digital devices, preserved quality of stored information, re-defined e-learning, and advanced transportation. On the other hand, there are threats in the digital revolution, including security breach, social isolation, redundant work, diminishing job opportunity, digital addiction, manipulation, and plagiarism.
- According to the World Bank in 2021, 54% of working-age women are active in the labor force compared to 82% of working-age men in Indonesia. That means for every one female worker, there are approximately two male workers. More interestingly, this rate has been stagnant for the last 20 years. Female workers in Indonesia also earn 23% less than their male peers. These statistics are not quite different around the world.
- The main thing that needs to be done to eliminate the gender gap is to improve digital literacy to its core then this will increase the female employment rate. The gender gap can be closed when women's earnings can increase by 20%, and women have equal opportunity with male counterparts, from the job qualification aspect to status and voice
- By increasing their knowledge of technology including machine learning and software, individuals will adapt better to the digital revolution. Repetition and consistency in learning new things are the keys to be able to adapt to these changes.
- From the employers' point of view, employers need to provide learning opportunities to solidify the skills of their employees. Then pair them with the mentor, homosapiens is also known as “homo imitants”, human beings are genetically designed to cope with challenges by carefully copying others. Build a sandbox culture that allows employees to think outside the box and use a bottom-up approach to solve unique issue. Then, conduct regular skill evaluations and provide incentives with guidance.

The Public Sector's Role: How Policymakers Help Women to Transform Their Work in The Future.

Presentation by Sudi Astono – Coordinator of Osh Norms Inspection, of Ministry of Manpower Republic of Indonesia

- The objectives of manpower development based on Law 13 of 2003 are to empower and utilize the workforce optimally and humanely, to realize equal distribution of employment opportunities and to provide manpower according to the needs of economic development, to protect the workers in realizing and improving the welfare of the workforce and their families.
- The role of women is very important and crucial. Apart from being the driving force of the economy and supporting the distribution process, it also acts as the spearhead of the process of making semi-finished goods or raw goods into goods that are worth selling with high economic value.
- The total working population in Indonesia is around 131.05 million people, and 51.7 million of them are women (39.5 %). The participation rate of the female workforce is 53.34%, while the male is 82.27%. On the other hand, the average wage received by female workers is 2.3 million rupiah, while male workers receive an average wage of 2.9 million rupiah.
- Women workers bear a double burden, which is apart from supporting the family economy by working, they are also burdened with taking care of the household. Moreover, during a pandemic like now, they have a new additional burden, namely being responsible for assisting the children's education process (online education).
- The low participation of female workers in the industrial sector is caused by the stigma that the work environment in the most industrial sector involves physical characteristics, which are identical to men, and unattractive to female workers. There is low absorption of labor in the industrial sector for female workers graduates who obtain degrees related to the science, technology, engineering, and mathematics industries compared to men. There is still a gap in women's access to information technology and computers.

- With the help of technology, female workers can be involved in jobs that require a large amount of labor (so far, the sector of work has been identical to that of men). Women workers can optimize part-time jobs that grow and develop by utilizing digital technology, such as e-commerce and programming.
- By utilizing digital technology, female workers can improve their competence through training programs that have been provided by the government through digital platforms.

Presentation by Kivilcim Sanem Sara - Senior Expert, Ministry of Labour and Social Security of the Republic of Turkey

- Women in the world are often at a disadvantage in the labor market at a different level. There is a persistent gender gap in income level, career opportunities, and social security. Not only that, but women also tend to have a higher chance of experiencing problems with increasing housework and care responsibility, increasing workload with remote/home, anxiety, domestic violence, and insufficient salary during the Covid-19 period.
- The government has issued several policies to ensure gender-based recovery from the pandemic, including:
 - Investing in the care economy
 - Promoting gender-responsive employment policies for an inclusive and job-rich recovery.
 - Promoting more women in decision-making positions.
 - Eliminating domestic and work-related violence and harassment.
 - Promoting comprehensive, adequate, and sustainable social protection for all.
 - Promoting equal pay for work of equal value.
- There are several regulations in Turkey that ensure women get equal opportunities with men in every aspect of life and prevent discrimination against women. These regulations include the constitution, Turkish Civil Code, Family Courts, Labour Law, Turkish Penal Code, Civil Servant Law, etc.
- Although there have been several efforts to close the gender gap in recent, the results achieved have not been at the desired level. The rate of women studying

at universities is 48.93%, the rate of female academics is 45.38%, and the rate of women working in the technology sector is only 9.91%. The low population of women working in the technology sector is due to an image imposed on women in the family and society, insufficient role models, and discrimination against women.

- Turkey will continue to increase the participation of women in STEM education in Turkey. These approaches have been implemented in the 11th Development Plan (2019-2023). Vocational training and skills development opportunities for women will be strengthened, especially in the fields of production technology, such as coding and software, in a way that will increase female employment in the labor market. Considering that 75% of all future jobs will require STEM skills and knowledge, it's essential to push women to participate in STEM education.
- Public institutions in Turkey have been implementing several specific projects to promote gender equality, including:
 - Promoting Decent Future of Work Approach with Focus of Gender Equality project by Ministry of Labour and Social Security.
 - Technology for Women Project by Habitat & TEKNOSA.
 - Women First in Entrepreneurship Project.

- **Session 4:**

Moderator: Fauziah Rizki Yuniarti – Lecturer in Economics Department, Universitas Indonesia

This session aimed to share experiences from the developed economy in women's role in the transition era of automation and provide recommendations for APEC's program on accelerating women's empowerment and leadership through the digital economy.

The Developed Economy Perspective on Women's Role in the Transition Era of Automation

Presentation by Okkie Nikijuluw – UK-Indonesia Tech Hub Director, British Embassy Jakarta

- Around the world today, some 250 million fewer women than men are online. In developing economies, limited access often concerns women living in Sub-Saharan Africa and rural parts of Asia. In developed economies, women face a facet of the

digital gender divide: the systematic under-representation in information and communication technology (ICT) jobs, top management, and academic careers. For instance, women worldwide are 20% less likely to hold a senior leadership position in the mobile communication industry. They make only 8% of the investing partners at the top 100 venture capital (VC) firms. The gender gap in science, technology, engineering, and mathematics (STEM) fields grows with age. Software development still seems to be (mostly) a male-dominated club.

- We are now in an era often called the fourth industrial revolution, characterized by a technological fusion that blurs the lines between the physical, digital, and biological spheres. This technology-fueled period will give economies and companies a significant opportunity to improve their productivity and enhance their efficiency and growth. At the same time, automation technologies will undertake some work activities currently performed by humans—a development that has sparked concern, both in the public debate and among policymakers.
- Whether automation will affect men and women to different extents is not clear. While the risk of automation has traditionally been highest in manufacturing, where men dominate, OECD analysis shows a mixed and more nuanced picture. Some large industries with high shares of women, such as food and beverage service activities and retail trade, appear at a high average risk of automation.
- Men, in turn, feature prominently in industries like manufacturing, construction, and transportation, where the average risk of automation is also high. Other sectors, such as education, social work, and health care seeing an important presence of women have a lower risk of job automation, but since many women work in these large sectors, the absolute number of female workers at risk of being displaced is still high.
- Automation helps people improve their overall contribution to the organization by minimizing routine and time-consuming manual tasks. Automation should be implemented gradually to support strategic goals and only applied to the processes that meet your automation criteria. Choosing the right automation platform and tools can help scale and build resilience across the organization. It can provide reliable oversight and visibility of operations to better manage complexities and reduce costs,

which is essential for organizations to remain transparent and trustworthy while operating within defined budgets.

- In Indonesia and around the world, some jobs (especially repetitive work, such as data collection) will indeed be increasingly automated. However, as with technological innovation in previous eras, new work will also be created, and many jobs will change. This in turn will have a significant impact on the skill and educational requirements of the workforce. For companies, automation will probably heighten competition and pose new organizational challenges.
- The UK digital access program in Indonesia has 3 main pillars, including:
 - Pillar 1 Digital Inclusion: Test and validate innovative business models that promote an affordable sustainable extension of internet access for poor and excluded populations.
 - Pillar 2 Digital Security: Support partner economies' capacity to prevent and respond to cyber-security risks and harms, affecting governments, businesses, and citizens (including vulnerable groups at risk of online abuse or exploitation).
 - Pillar 3 Digital Transformation: Stimulating local digital economies, building high-end digital skills, and forging partnerships between local tech sectors and international businesses (including UK firms) through a Tech Hub network.

The Emerging of Gig Economy: Empowering Women's Role in the Fast-Paced Automation Industry

Presentation by Grace Retnowati - Country Director of MicroSave Consulting Indonesia

- Gig economy is a labor market characterized by the prevalence of short-term contracts or freelance work as opposed to permanent jobs. There are several important characteristics of the gig economy, including flexibility, low-entry barriers, short-term, and trust achieved by social feedback (ratings and reviews). The gig economy can be in the form of crowd work or on-demand work
 - Crowd work is commissioned and carried out virtually/cloud. Service purchasers advertise specific tasks on platforms, which can then be matched to suitably skilled crowd workers located anywhere in the world
 - On-demand work refers to tasks carried out locally, with the purchaser and the provider in physical proximity. These tasks are generally organized via

mobile platforms by the companies that set the terms of service (Lower-skill workers).

- In recent years, the gig economy has rapidly grown up in Indonesia. It is shown by the increase of gig workers in Indonesia every year. In 2019, 28% of the economy workforce was included as part-timer workers. In 2020, it significantly increased with the addition of 4.32 million people. It is obvious that the platforms are easing the gig workers' access to the market. However, these platforms also compete to make different products and offer more value propositions for their partners and the market. E.g.: some farmer platforms are not only helping the farmers to sell their products but also helping them to provide weather analysis or some ride-hailing platforms that compete to provide logistic services.
- Automation will accelerate the need for and size of the gig economy, as it displaces jobs and sources the talent able to deliver on certain competencies and tasks. Automation will also enable the gig economy to exist by connecting buyers and sellers. McKinsey's report predicts as many as 23 million jobs could be displaced by automation in Indonesia by 2030, between 27 million and 46 million new jobs could be created in the same period. Given relatively equal participation of women in entry-level positions and tertiary educated graduates, women may be able to benefit from the entry-level jobs created due to automation.
- However, in order to reap the benefits of automation, gender divide and inequality will have to be carefully addressed. There's a risk that gender and racial inequality will be exacerbated by automation, as women and some ethnic minority groups are more likely to work in the lower-skilled jobs that are susceptible to automation. Furthermore, women in Indonesia are employed predominantly in jobs requiring low STEM skills, which are clearly at risk of automation.
- To address these problems, we should emphasize on intersectionality, labor policy reform, digital inclusion, labor union, platform work, and capacity development. The policy recommendation that can be implemented to close the gender gap in the era of automation, including:
 - Addressing the digital divide
 - Work with a supply side to provide fair, quality work, and promote women's role in non-traditional occupations.
 - Gender, age, and disability disaggregated data for informed policy design.
 - Investment in skilling, upskilling, and re-skilling to prepare women for the digital economy.

- Public-private partnership for better access to social protection programs targeted at women.

Wrap Up Session: Policy Recommendation for Women Empowerment in the Transition Era of Automation

Presentation by Tunggal Pawestri - Executive Director at Humanist and Social Innovation Foundation

- Covid-19 is increasing the speed of adoption of automation across economies. Low-skilled jobs, which are mostly women's jobs, will be most affected by automation. Closing this gender gap takes different times in each economy. Western Europe is an economy that will close the gender gap faster than other economies, which will take 46 years. In addition, South Asia is an economy that will close the gender gap longer than other economies, which will take 1000 years.
- In terms of employment and pay gap, there's still lower participation of women in the labor market compared to men. Wage and income gaps remain large. Women are paid 23% less than men (ILO, 2020), with no improvements since the early 2000s. In Indonesia, the percentage of women's employment in the informal sector is higher than men (less protection).
- In terms of re-skilling and up-skilling, over 57% of the jobs set to be displaced by digital automation between now and 2026 belong to women. 54% of all employees will require significant re-skilling by 2022, and 75 million jobs will be displaced by 2022 in 20 major economies, and 133 million new roles are expected to be created. Women are at higher risk of automation induced job-displacement than men because of the type of tasks they perform.
- In terms of the gender digital divide, globally 48% of women use the internet compared to 58% of men. In Indonesia, 77% of mobile users are men and 71% are women.
- To address these issues, there are several policy recommendations that can be done, including:
 - Invest in more and better data and research for evidence-based policymaking and advocacy for gender equality using intersectionality perspective.
 - Early exposure to computing and technology, an incentive for STEM careers (education to all students about gender stereotypes and biases in the tech world).
 - Fulfil the commitment of STEM Principles and Actions as part of its Women in STEM Initiative APEC (2016).

- Provide women with inclusive trainings, the right skills (hard and soft skills) for a higher tier, less clerical jobs (become more valuable workers).
- Close Gender Gaps in Leadership positions through different interventions.
- Bridge the digital gender divide and promote digital safety and security.

Presentation by Tri Mulyaningsih - Lecturer of Universitas Sebelas Maret

- The Covid-19 pandemic shocks female workers in terms of transition to work from home, unemployment, and reduction of working hours..
- Female workers are severely affected due to sectoral and occupational structures and working status.. The pandemic is particularly hard for female workers with low education, contingent workers, non-telecommute, and working in the social sector.
- The reduction of working hours is contributed mainly by the employment lost, and this reduction was larger for female workers compared to male workers
- Females and those who have low education dominate the distribution of contingent workers. During the uncertain time as in the pandemic, contingent workers may experience a higher employment adjustment and job instability.
- Covid-19 has a great crash on industries with high proportions of female employment. Female workers are concentrated in more severely affected sectors such as hospitality and services. Women, on average, perform more routine or codifiable tasks than men across all sectors and occupations—tasks that are more prone to automation.
- Women perform fewer tasks requiring analytical input or abstract thinking (e.g., information-processing skills), where technological change can be complementary to human skills and improve labor productivity.
- There is nearly 5% of the average prevailing gender wage gap driven by differences in the tasks performed by men and women within the same occupations and sectors, which implies that task composition has an impact on returns to labor market participation as well.
- New technologies could thus further drive down demand and reduce relative wages for the routine tasks that women perform, lowering returns from labor market participation. So, in order to address these issues, several policy recommendations can be implemented, including:

- Early investment in women in STEM fields, along with peer mentoring to break down gender stereotypes and increase retention.
- Upskilling and reskilling.
- Fiscal instruments for those already in the workforce (e.g., tax deductions for training, portable individual learning accounts) to remove barriers to lifelong learning.
- Social protection systems to adapt to the new forms of work.
- Family-friendly policies have an important role in boosting women's retention and career progression.

- **Closing Remarks**

Lenny N Rosalin - Deputy Minister for Gender Equality Ministry of Women Empowerment and Child Protection of the Republic of Indonesia

The workshop that was held for two days has run well with all the valuable contributions given by the speakers, panelists, and participants. We expect that this workshop can give a breakthrough in strengthening the presence of women in future jobs and improving overall women`s wellbeing.

This workshop has educated all of us on how artificial intelligence can break down barriers, open up new opportunities, and help women to participate in the workforce in the era of automation.

The discussion regarding the impact of automation will create a significant productivity gain. Allow industries to increase their economic scale faster and society also become wealthier. However, the changes can affect men and women differently because they tend to have different jobs in the labor market.

Women are more likely to be affected by the growth of automation, especially those who are working in the informal sector. Without policy intervention, automation can increase the gap of income, wealth, and power in the economy. Future job will require people to closely work with technology. So, the company that adapts digitalization and workers with high skills will gain from this situation. Meanwhile, others will be left behind. It is our responsibility to ensure all society will take the benefit from the economy and no one is left behind, particularly women. We need to ensure that women have sufficient power and skills to adapt to the future transition.

Women are not acquiring relevant skills, high growth, and well-paid occupation, such as professional, scientific, and technical services. We need to create a meaningful intervention to ensure women adapt and contribute to the future jobs.

IV. Briefings on Discussions at the Workshop

In this session, participants were actively participating in the discussion.

Q&A / Discussion

- **Session 1**

- a. The participant asked Ms. Dwini regarding the research stated that women in Indonesia are low educated and more vulnerable when they work in manufacturing companies. The participant asked for policies or program recommendations for the government to improve special skills for women.

Ms. Dwini suggested to increase women's skills, like giving training and preparing them for digitalization and financial inclusion by encouraging them to become digitalized entrepreneurs. Covid-19 has changed the situation making people more familiar with digitalization. So, encouraging women to be more digitalized is one of the recommendations that can be taken.

- b. The next participant asked about what we should do to prepare women in Indonesia to remain in the labor force, prevent job losses for them, what kind of jobs we can prepare for them, and what areas we can use to mitigate the impact of automation.

Ms. Dwini answered that we should encourage women to have a job that can be done at home. We need to pin out what kind of jobs can be done from home. Employees in the future need to start their business in a hybrid mode. So, women can have their flexibility. The health, education, and manufacturing sectors are promising in the future. However, the most important one is to encourage women to have a higher education so they can enter the managerial level in the labor force.

- c. The next question is regarding childcare facilities provided by the government. As known, women choose to resign from their jobs because they need to take care of their children. In other economies, childcare facilities are provided by the government. The participant asked whether the government could provide childcare facilities since not

every woman has enough income to pay for. The participant asked about the policy or chance for the government to provide childcare facilities for women with low income.

Ms. Dwini said that childcare is one of the important factors that influence women in work. However, regarding this problem, we cannot rely on the government due to limited resources. Compares to other economies, they use social capital like church. We need to encourage this idea among our social capital in Indonesia. For example, by empowering religious communities like a mosque or Corporate social responsibility. We can also encourage the factory industry employers by giving them tax deductions or some lowering cost of their production.

- **Session 2**

- a. The participant asked Mr. Didit regarding Siklus' initiatives to help low-income society to afford cooking oil in Indonesia.

Mr. Didit explained that there is more than 500 million pouches and sachets of cooking oil sold every day in Indonesia and its market size is estimated around USD 10 billion. Siklus offers a 10-30 cheaper price and it's convenient because of the door-to-door delivery mechanism without extra cost and a single use of plastics. It is a win-win solution because they can get cheaper products.

- b. The participant mentioned that the digitalization in the last decade has brought not only opportunities but also threats to the way we work. Many jobs were created, but many also disappear during digitalization, and it affect men and women in different ways. Considering that women are mostly concentrated in low-skilled labors and labor-intensive jobs, participant asked Unilever's response to this issue and what they would do to ensure that women in Unilever's businesses can pursue the inevitable automation of processes.

Mr. Ilvan responded that Unilever is pro inclusivity and diversity that support women in the workforce in any sector. Unilever is also committed to have a gender-balance organization from the top level until factory level. Unilever has automated the operation around 10 years ago. It means that Unilever only has a small number of manual works left, mostly in the packing line. The important thing is the cooperation between government and industry to not only protect but to improve livelihood for women working in manual intensive work and also invest to relearn and reskill for these people.

- c. The participant asked Mr. Phu Huynh on best practices from other economies to ensure women's transition from conventional to automated digital world of work.

Mr. Phu answered that a lot of different initiatives are taken by every APEC economy. A different aspect of nature will lead to different challenges. One example is Singapore. They have invested heavily in a program that accelerates skills for adults aged 18 – 25 years old to develop their skills. It was an opportunity for them to upgrade their skills with training and learning, reskill, upskill, human capacity in different jobs in new sectors that are emerging. The program really helps to make the workers being controlled and can transform their opportunity in the labor market and really can take advantage of new opportunities, whether from technology or other transformation are taking place.

- **Session 3.**

- a. The participant asked about the education and skills needed by women in order not to be left behind. HE also asked about the speaker's views on data security and the application of digital technology in business.

Ms. Moorissa responded that the gender gap issue is rooted in childhood, emphasized by cultures and family backgrounds that create stereotypes. As a result, women tend to grow up with less opportunities compared to their male counterparts. Giving girls more exposure to technology and instilling powerful values about their potential within STEM will help close the gender gap.

Data security is important for a company. It becomes a challenge and opportunity at the same time to keep innovating with new tools and security issues that increase every year.

Talking about breaking the barriers, it is hard to break the stereotypes of women that are less technical. Supportive family and community are important to motivate more women to jump into technical roles. Having a role model to young is important for having a technical perspective role.

- b. The participant asked that the use of automation will cause technology and machines to take over current human tasks. But in fact, this revolution and transformation will also open more opportunities and new types of jobs. But there is still a perception that

automation will reduce employment opportunities and wages. Then participant asked about the speaker's views on this issue.

Ms. Moorissa explained that diminishing job opportunities is inevitable because we are changing from one stage to another using different tools and resources. The government needs to create a phase in digital transformation. Because with the phase created, there's enough time to educate people for dealing with the transformation.

- c. The participant asked whether there are any gender criteria or targets when the ministry of labour and social security formulates the labour policy. For example, whether there is an obligation for the companies or employers to have a certain proportion of workers based on gender. He also asked regarding policy that the ministry imposes to make sure that women have equal opportunities in the workplace.

Mr. Sudi explained that the general policy in the Ministry of Manpower does not discriminate between men and women. There is an equal opportunity for women to work in various sectors. Currently, there is no specific policy about company obligation to accommodate women workers in equal proportion. The Ministry of manpower is open to getting inputs from stakeholders regarding women workers.

Ms. Sanem Sara added that there is no certain quota for gender employment in the workplace. However, the Ministry of Labour and Social Security of Turkey has drafted the National Employment Strategy 2014 – 2020. In the strategy, there are certain targets that include women employment in the future. The women's employment rate is targeted to increase 38% by the year 2023. The roadmap was drafted by the public institution as their form of responsibility of the program and the private sector company is being involved in the roadmap.

- d. The participant asked about the programs or activities that the government provides to women empowerment, especially, to increase women capacities to adopt the digital technology.

Ms. Sanem replied that the public sector and private sector have cooperated in the technology sector, economic development, and STEM education. This cooperation is designed to improve women wellbeing, especially women who live in rural areas.

Mr. Sudi answered that the Ministry of Manpower has a program called BLK Komunitas. It is a training center that spread in Indonesia, and it cooperates with the related

stakeholders to create synergy by providing training and learning access. Women also can use this program to enhance their capacity.

- e. The next participant asked about the policy to promote equal opportunities for women and its implementation in Turkey.

Ms. Sanem Sara explained that the policy in Turkey is created by related public institutions. Some action plans are prepared in line with the strategies. Regular meetings with all related stakeholders were held to synchronize the strategies and programs so it can reach the targets set.

- f. The participant asked about the obstacle in increasing mental health awareness in Turkey, especially for women.

Ms. Sanem Sara answered that there are women consultation centers in all provinces in Turkey. Consultants are working there to help women who have mental health problems and any other related matters.

V. Summary of the Workshop

From the speaker's presentation and the productive discussion in the workshop, several key findings are summarized as follows:

- The role of women is very important and crucial. From the driving force of the economy and supporting the distribution process to the spearhead of the process of making semi-finished goods or raw goods into goods that are worth selling with high economic value both in rural and urban areas. The gender gap needs to be eliminated by improving the digital literacy of technology for women. Employers need to provide learning opportunities to solidify the skills of their employees.
- Automation creates opportunities and challenges for the economy and actors. Automation will increase productivity at the same time also cause job loss for those who cannot adapt to it. There are four labor sectors identified that will have a great impact from automation, including healthcare, manufacturing, construction, and retail. The biggest job losses will be in service sectors, machine operators, and craft workers. Meanwhile, the biggest job gains will be in the healthcare and manufacturing sectors.

- Women are prone to job loss because most of them are in low educated labor, have less access to digitalization, have job stereotypes, and multiple burdens between professional and family lives. Women are vulnerable to digitalization, some of them lose their jobs because of automation, and the remaining job is left for those who are highly skilled, and techno prepared.
- In 16 APEC economies, women across all sectors are take-into-account for 40-45% of total employment, but the concentration for each sector is different. The high sectors for women are in the human health, social work, retail, and wholesale trade. Meanwhile, the lowest is in the construction sector. For manufacturing sectors tend to be balanced. Women in some major economies in the APEC region are facing automation risk due to some jobs they took, which are at high risk of automation, such as admin & support service and retail trade, cashiers, secretaries, bookkeeping, and clerks.
- In the terms of re-skilling and up-skilling, over 57% of the jobs that are set to be displaced by digital automation between now and 2026 belong to women. 54% of all employees will require significant reskilling by 2022, and 75 million jobs will be displaced by 2022 in 20 major economies, and 133 million new roles are expected to be created.
- Women are almost left behind in all parts of the world in terms of jobs related to digital and technology, particularly in APEC economies. The average value of women labour force participation rate is 57,6 in 2019 and it is dominated by low educated labor. Moreover, women have smaller networks than man, which could impact their ability to become aware of and capitalize on new employment opportunities. Fewer than 20% of technology workers are female in many mature economies.
- Women worldwide are 20% less likely to hold a senior leadership position in the mobile communication industry. Women make only 8% of the investing partners at the top 100 venture capital (VC) firms. The gender gap in science, technology, engineering, and mathematics (STEM) fields grows with age. Software development still seems to be (mostly) a male-dominated club. Further, wage and income gaps

remain large. Women are paid 23% less than men (ILO, 2020), with no improvements since the early of 2000s.

- The top five of the most powerful tech companies in the world only have 34,4% of women in the workforce. The senior and managerial levels are taken only by a few women. But overall, the representation is growing from 25,9% in 2018, 26,2% in 2019 to 28,8% in 2020 (AnitaB.org, 2020). The growth of women representation in technology is 4,96% per year. It means that they need 12 years to reach equal representation.
- The current situation in automation is on the hardware and software side. It means that the world of automation will be larger and more knowledge need to be given at the university/high education level. Women need to have higher education and skill to be successful in the transition era of automation. Women need to advance their skills, mobility, and task savvy to overcome the disruption and adapt to the new world of works. Work flexibility has positive and negative effects on women in the gig economy. It requires them to be able to work anywhere and anytime and can negatively affect the work-life balance.
- Some actions can be done to improve the skills development of women, such as enhancing access to gender-responsive education, training, and employment services, promoting digital and soft skills development and STEM-related career tracks, investing in social protection, including income support during transitions, and recognizing value and redistributing unpaid care work.

VI. Participants of the Workshop

The workshop was expected to benefit women through knowledge improvement, up-skilling, and re-skilling, especially to keep pace with rapid technological and digital transformations. This workshop emphasized the discussion on policy recommendations to enhance women's participation in the era of automation, especially for developing member economies. APEC representatives from developed economies were invited to participate, and their attendance contributed to designing policy recommendations on the future of work for women.

The workshop targeted at least 22 participants from 11 travel eligible economies and 100 other participants including women entrepreneurs, academics, and government officials. The organizers expected composition of 1:1 between women entrepreneurs and other target group participants. The workshop itself was attended by 158 participants with 135 of them were women.

The workshop was attended by 7 APEC economies and one other economy beyond APEC. The APEC member economies participating in the workshop was counted 157 attendees, which consist of participants from Australia, Brunei Darussalam, Indonesia, Malaysia, Mexico, The Philippines, and Viet Nam. The proposal targeted 4 female speakers/moderators who will contribute to the workshop. Several experts would share their knowledge and experience in the workshop. The event managed to present 14 experts acting in various subjects related to women enrollment and automation technology.

The detail on workshop participation is given in the following table.

Table 1. Workshop Participation

Economy (of Participants)	# male	# female	Total
<i>(Insert rows as needed)</i>			
Australia		2	2
Brunei Darussalam	1		1
Indonesia	19	127	146
Malaysia		4	4
Mexico	1		1
The Philippines		2	2
Viet Nam	1		1
Participants from APEC	22	135	157

Turkey	1		1
Participants from other	1	0	1
Participants (total)	23	135	158
Economy (of Experts)	# male	# female	Total
<i>(Insert rows as needed)</i>			
Indonesia	4	8	12
Viet Nam	1		1
Turkey		1	1
Speakers/Experts (Total)	5	9	14

VII. Pre-Test and Post-Test Evaluation

Before the workshop, the participants were asked to fill in the pre-test that consisted of 10 true/false and multiple-choice questions to assess the participants' knowledge relevance to the workshop topic. The participants were requested to complete and turn in the pre-test before any instruction began. After the workshop, the participants were tested with the same questions to evaluate the increasing participants' knowledge. The pre and post-test were used and utilized as comparative data to measure the level of knowledge of the participants before and after the workshop. The targeted level increase in this workshop is 30%.

A total of 159 participants attended the workshop, with a total of 139 were valid or 87.35%, matching pre-/post-comparisons available for analysis. The data for each question was entered and calculated in Microsoft Excel. Results in Table 1 show the percentage of participants with correct answers on the pre-test and post-test. The post-test results showed a correct response of 92.30%. Thus, the knowledge gain for participants in the workshop was 33.20%.

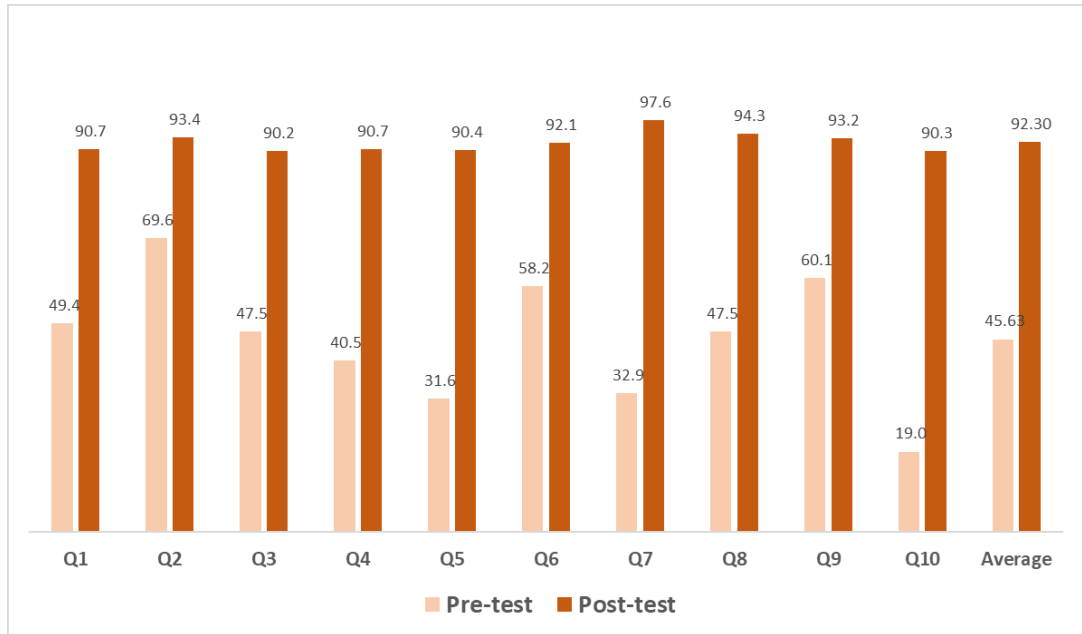


Figure 1. Pre and Post-Test Result

VIII. Evaluation Test

After the workshop, the committee distributed the evaluation survey to all participants. The evaluation survey was set to measure the effectiveness of the workshop and the relevance with the topics, presentation by speakers, overall impact, and suggestions for further improvement and/or activities for future projects. From the workshop, as many as 140 participants (89% of total participants) managed to fill out the evaluation survey. According to the result of the evaluation survey, all respondents replied 'Strong Agree' and 'Agree' to all of the items were questioned (question number 1-9).

Workshop participants provide feedback for this event and provide suggestions for future events. Some participants expressed that the workshop was very beneficial. The participants expected that the future workshop would be focused on enhancing women understanding related to STEM and embracing Industrial Revolution for women.

The evaluation test result is given in the Table below.

Table 2. The Evaluation Test Result

No.	Questionnaire	Strongly Agree	Agree	Disagree
1	The objectives of the training were clearly defined	93.3	6.7	0.0
2	The project achieved its intended objectives	89.6	10.4	0.0
3	The agenda items and topics covered were relevant	76.7	23.3	0.0
4	The content was well organized and easy to follow	91.2	8.8	0.0
5	Gender issues were sufficiently addressed during implementation	95.5	4.5	0.0
6	The trainers/experts or facilitators were well prepared and knowledgeable about the topic	84.9	15.1	0.0
7	The materials distributed were useful	87.7	12.3	0.0
8	The time allotted for the workshop was sufficient	84.1	15.8	0.1
9	How relevant was this project to you and your economy?	89.9	10.1	0.0

IX. Recommendation

From the discussion, we have concluded several recommendations from the speakers and the active participants. The six recommendations are differed in three main issues related to the future of women work in the automation era, which are:

1. Recommendation related to the labor supply side. To provide women labor in the STEM career, some recommendations that need to be carried out, including:
 - i. Preparing women with the skills they need to enter the labor force. It is important to encourage women to enter STEM fields to break down gender stereotypes. It could be done by expanding access to postsecondary education and training and enhancing skill development.
 - ii. Encourage women entrepreneurship by providing them digital literacy, financial inclusion, and access to the network.
2. Recommendations to prevent women from losing job:

- iii. To ensure women's retention and career progression, family-friendly policies are needed, and a conducive environment of gender norms is necessary for balancing responsibility with domestic works.
 - iv. Adapting the new forms of work and ensuring women are capable of upskilling and reskilling, proper financial instruments policies are needed for those who are already in the workforce. Elements for a supportive framework for the future of women at work and preventing women from losing jobs including enhancing access to gender-responsive education, training, and employment services; promoting digital and soft skills development and STEM-related career tracks; investing in social protection, including income support during transitions; and recognizing the value and redistributing unpaid care work.
3. Recommendations to benefitting the automation for women at work:
- v. To take the benefits of automation, the gender divide and inequality will have to be carefully addressed since women are more likely to work in the lower-skilled jobs that are susceptible to automation. Policy responses to prepare women facing automation include:
 - o Encouraging women to study and work in STEM. It denotes early exposure to ICT and incentives for STEM careers.
 - o Strengthening digital literacy for women by providing women with inclusive training and the right skills (hard and soft skills) for higher tier and less clerical jobs.
 - o ICT Infrastructure development in both urban and rural areas.
 - vi. To take benefit of automation for women's future at work, we should emphasize intersectionality, labor policy reform, digital inclusion, labor union, platform work, and capacity development. The policy recommendations to address this issue include:
 - o Work with the supply side to provide fair, quality work, and promote women's role in non-traditional occupations.
 - o Invest in more and better data and research for evidence-based policymaking and advocacy for gender equality using intersectionality perspective. It includes providing disaggregated gender, age, and disability to support policy design.

- Increase investment in skilling, upskilling, and re-skilling to prepare women for the digital economy.
- Public-private partnership for better access to social protection programs targeted at women.