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MAINSTREAMING GENDER AND ICT ACROSS ASEAN MEMBER STATES

Current Situation and Policy Recommendations



DICT
DEPARTMENT OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY





ASEAN Project: Digital Innovation for Women Advancement (DIWA)

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List of Acronyms

ACW	ASEAN Committee on Women	KUR	Kredit Usaha Rakyat (Indonesia)
ADLP	ASEAN Digital Literacy Programme	MaGIC	Malaysian Global Innovation and Creativity Centre (Malaysia)
ADM	ASEAN Digital Masterplan	MCMC	Malaysian Communications and Multimedia Commission
AI	Artificial Intelligence	MoE	Ministry of Education (Singapore)
ATI	Authority for Info-Communications Technology Industry (Brunei)	MSMEs	Micro, Small, and Medium Enterprises
ASEAN	Association of Southeast Asian Nations	NLB	National Library Board (Singapore)
ASEAN-DIWA	Digital Innovation for Women's Advancement in Southeast Asia	OECD	Organisation for Economic Co-operation and Development
BPO	Business Process Outsourcing	PISA	Program for International Student Assessment
CEDAW	Convention on the Elimination of All Forms of Discrimination Against	PPA	Program, Project, and Activity
COVID-19	Coronavirus Pandemic	PPP	Public-Private Partnership
CPGE	Committee to Promote Gender Equality (Thailand)	PPPA	Ministry of Women's Empowerment and Child
DICT	Department of Information and Communications Technology (Malaysia)	RM	Malaysian Ringgit
DIWA	Digital Innovation for Women's Advancement	RPA on EVAW	ASEAN Regional Plan of Action on the Elimination of Violence
DMIL	Digital, Media and Information Literacy	SMEs	Small and Medium Enterprises
GAD	Gender and Development	STEM	Science, Technology, Engineering, and Mathematics
GBV	Gender-Based Violence	UDHR	Universal Declaration on Human Rights
GRB	Gender-Responsive Budgeting	UN	United Nations
ICT	Information and Communications Technology	UNDP	United Nations Development Program
ILO	International Labour Organization	UNESCAP	United Nations Economic and Social Commission for the Asia
IMDI	Indeks Masyarakat Digital Indonesia (Indonesia)	UNESCO	United Nations Educational, Scientific and Cultural
IoT	Internet of Things	UNICEF	United Nations Children's Fund
IT	Information Technology	USAID	U.S. Agency for International Development
ITU	International Telecommunication Union	USD	United States Dollar
JENDELA	Jalinan Digital Negara (Malaysia)	VAWC	Violence Against Women and Children
Kominfo	Ministry of Communication and Digital Affairs (Indonesia)	YAG	Youth Advisory Group

List of Tables

Table 1. Year of CEDAW Ratification by ASEAN Countries	p. 23
Table 2. Legal Review Matrix of Gender Equality Laws in ASEAN Member States	p. 24-25
Table 3. Availability of Sex-Disaggregated Data on Digital Access and Use in ASEAN	p. 43

List of Figures

Figure 1. Digital Gender Parity in ASEAN	p. 12
Figure 2. Percentage of Device Ownership by Females	p. 14
Figure 3. Proportion of Women in the ICT Sector by ASEAN Countries	p. 18
Figure 4. Gender Inequality Index (GII) in the ASEAN Region, 2013	p. 25
Figure 5. Logo of the DIWA Program (Digital Innovation for Women Advancement)	p.26
Figure 6. Young Malaysian Students Reading Malaysia Education Blueprint 2013-2025	p. 27
Figure 7. Share of Women Business Owners (% of Total Business Owners), 2021.	p. 29
Figure 8. Go Digital ASEAN's initiative to empower individuals and communities towards digital literacy	p. 30
Figure 9. Female start-up leaders at a technology event in the Philippines	p. 31
Figure 10. Gender Gap in Internet Access in ASEAN, 2022	p. 39
Figure 11. Mobile Phone Ownership by Gender in Selected ASEAN Countries, 2015-2024.	p. 40
Figure 12. ICT Course Enrollment Rates in Singapore by Gender, 2005-2023	p. 41
Figure 13. Gender Gap in ICT Course Completion Rates in Singapore, 2005-2023.	p. 42
Figure 14a. Percentage of Women in the ICT Workforce in Selected ASEAN Countries, 2014-2024	p. 47
Figure 14b. Percentage of Women in ICT Management Positions in Selected ASEAN Countries, 2011-2023	p. 47
Figure 14c. Percentage of Women in ICT Management Positions in Selected ASEAN Countries, 2011-2023	p. 47
Figure 15. Gender Pay Gap in the ICT Sector in Selected ASEAN Countries, 2018-2023	p. 47
Figure 16. Length of paid parental leave in ASEAN showing (a) paternity leave for men and (b) maternity leave for women, measured in calendar days.	p. 59

Executive Summary

The digital transformation in Southeast Asia brings new opportunities for countries in the region to grow their economies, improve their public services, and support innovation across many sectors. Despite this reality however, the majority of the women in the region remain underrepresented in the ICT sector. According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), increasing women's involvement in digital economies can lead to higher productivity, better use of talent, and more inclusive innovation. **With ASEAN aiming to achieve a USD1 trillion digital economy by 2030, the underutilization of women's skills and perspectives in the ICT sector represents a lost opportunity to boost regional competitiveness and innovation capacity.**

Current State

As of 2020, women accounted for approximately 22% of ICT roles in Indonesia and up to around 42% in countries like Thailand, with an average female representation of roughly 30-40% across ASEAN member states. Gender-disaggregated ICT data across ASEAN member states show significant divides in a number of indicators including digital access, skills and participation among others. Indonesia has shown steady improvements over the years, reducing the gender gap in internet access from 8.18 percent in 2015 to 4.2 percent by 2023. At the other end of the spectrum, countries like Brunei and Cambodia show otherwise.

The educational pipeline data show the most worrying trend for long-term gender parity in ICT. **Women consistently report significantly lower proficiency in specialized areas such as programming, device setup, and technical software management.** These skill deficits are not only persistent but also critical because they are directly linked to access to better-paying and more secure jobs in the ICT sector.

Systemic and Structural Barriers

Women across ASEAN still face numerous barriers to full participation in the ICT sector. These barriers are multidimensional and deeply rooted in systemic and institutional structures. One of the fundamental barriers to bridging the gendered digital divide around the world is limited access to affordable digital devices for women and girls. Gender stereotypes also continue to shape the landscape of ICT participation in ASEAN by reinforcing the perception of science and technology as a male-oriented domain. The combination of family expectations together with community expectations forms a substantial challenge that prevents women from participating in ICT activities across ASEAN where collectivist cultural values often prioritize family harmony and adherence to traditional gender roles over individual career aspirations.

Even when women overcome systemic barriers to enter the ICT field, they often encounter workplace and industry barriers that may impede their career progression. Women in tech jobs frequently report feelings of isolation, lack of mentors, and even explicit or implicit biases from colleagues. Moreover, most ASEAN countries now often have gender equality goals in their ICT and digital economy strategies. However, a major challenge lies in translating these policy commitments into effective action on the ground.

Promising Practices and Regional Initiatives

In recent years, there have been several best practices observed across the ASEAN region that demonstrate how gender-inclusive digital transformation can be both effective and sustainable. Since its inception, Go Digital ASEAN has trained over 215,000 individuals, more than 60% of whom are women, across all ten ASEAN member states. In Indonesia, the Ministry of Communication and Digital Affairs (Kominfo) launched the #MakinCakapDigital ("More Digitally Capable") campaign in 2021. The initiative aims to reach 50 million Indonesians by 2024 across all 34 provinces in the country.

An in-depth analysis of the practices in ASEAN shows that partnerships are fundamental to the success of gender integration in the region's ICT sector. **Programs tend to be more sustainable when local women's groups and community leaders are in charge of the project's implementation.** Another critical success factor is sustained resource commitments. In the Philippines, the Philippine Commission on Women (PCW) has been active in updating the country's Gender Equality and Women's Empowerment (GEWE) Plan 2019-2025, which includes strategies for integrating gender perspectives into various sectors, including ICT.

Policy Implications

Three critical insights emerge from this analysis: The digital gender divide isn't just about access but about a web of interconnected educational, cultural, institutional and economic factors. Although policy frameworks have evolved, implementation is fragmented, under-resourced and poorly monitored. The differences among ASEAN member states such as the reverse gender gap in the Philippines and persistent divide in Indonesia show that one size fits all approaches are inadequate; solutions should be nationalised and localised while ensuring regional coordination.

Critical Data Gaps

The persistent lack of standardized, comparable, and longitudinal gender-disaggregated ICT data across ASEAN member states presents a major barrier to evidence-based policymaking. Without accurate data, it is nearly impossible to measure gaps, evaluate progress, or understand where interventions are most needed.

Way forward

To achieve inclusive digital transformation, we need to move beyond policy formulation towards implementation excellence, from pilot projects towards scaled solutions and from isolated initiatives towards integrated approaches addressing the whole lifecycle of ICT participation for women, from early education to career advancement and entrepreneurship. These issues point to a broader need for ASEAN to move beyond its fragmented pilot projects and symbolic gestures. What is required is a coordinated and region-wide commitment that treats gender integration in ICT not as a luxury, but as a necessity. Only then can ASEAN truly build an ICT sector that reflects its diversity, while delivering inclusive growth that benefits everyone. A more equitable digital future is possible in the region, but it must be built deliberately, not left to chance, together with all relevant stakeholders in the community.

Current State of Women in ICT

8%

Global gender gap in internet usage

30-40%

Average female representation across ASEAN ICT workforce

Key Barriers



Digital Infrastructure Gaps

Limited access to affordable devices and reliable internet, especially in rural areas



Educational System Limitations

Gender stereotypes in STEM education and declining female enrollment in ICT courses



Social & Cultural Barriers

Gender stereotypes, family expectations, and lack of female role models in tech



Workplace Underrepresentation

Gender pay gaps, "bro culture," and limited career advancement opportunities



Data Gaps

Lack of standardized, gender-disaggregated ICT data across ASEAN



Resource Allocation Issues

Insufficient funding for gender-specific ICT programs and inconsistent implementation

Best Practices & Success Stories

Go Digital ASEAN

Trained 215,000+ individuals across 10 ASEAN states, with 60%+ being women

#MakinCakap Digital

Indonesia's nationwide campaign reaching 50m citizens by 2024

S.U.R.E. Campaign

Singapore's information literacy program promoting critical digital thinking

ASEAN Digital Literacy Programme

Youth-led initiative combating misinformation and promoting digital safety

Key Insight

Countries with sustained policy interventions, like Singapore and Malaysia, show consistent progress. The Philippines demonstrates that reverse gender gaps are achievable with the right approach.

Policy Recommendations



1 Education & Skills Development

Integrate digital literacy into national education systems with gender-sensitive approaches

From Policy to Implementation:

Move beyond fragmented pilot projects toward scaled, coordinated regional action treating gender integration in ICT as essential, not optional.

2 Workplace Inclusion

Implement strong anti-discrimination laws and gender-responsive parental leave policies

3 Entrepreneurship Ecosystem

Establish targeted innovation funds and accessible digital platforms for women entrepreneurs

Target: USD 1 trillion digital economy by 2030

4 Digital Safety & Inclusion

Develop comprehensive digital rights frameworks addressing gender-based online violence

Approach: Multi-stakeholder partnerships and sustained resource commitments

5 Data Standardization

Harmonize gender-disaggregated ICT data collection across ASEAN member states

Measurement: Evidence-based monitoring with standardized indicators



Introduction

The digital transformation underway in Southeast Asia brings new opportunities for countries in the region to grow their economies, improve their public services, and support innovation across many sectors. As all ten member states of the Association of Southeast Asian Nations (ASEAN) develop their respective national digital plans while working together on shared regional goals, it becomes more important than ever to make sure that every single one in the community has the opportunity to take part in this process, regardless of their gender or income level (ASEAN Secretariat 2021). As recent developments in technology have shown in many parts of the globe, Information and Communications Technology (ICT) can no longer be considered as a separate field of its own, as it plays a role in almost every part of modern life, from education to healthcare service (ASEAN Secretariat, 2021).

Despite this reality however, the majority of the women in the region remain underrepresented in the ICT sector. This includes not only technical jobs such as software development and computer engineering, but also research positions and leadership roles (Boston Consulting Group 2020; UNESCO 2023). **The low level of women participation in ICT does not only reflect ongoing gender inequalities in the region, but it also holds back the full economic potential of ASEAN as a whole as well** (Dalberg 2017). According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), increasing women's involvement in digital economies can lead to higher productivity, better use of talent, and more inclusive innovation (UNESCAP 2019; International Finance Corporation 2023). Without stronger efforts to close this digital gender gap, the benefits of digital growth in the region will continue to be unevenly distributed (UNESCAP 2022a).

The Digital Innovation for Women Advancement in Southeast Asia (ASEAN-DIWA) project aims to contribute to the narrowing of the digital gender divide by creative inclusive pathways for women and girls to participate meaningfully in the digital economy. Aligned with the ASEAN Digital Masterplan 2025 (ADM 2025), specifically Digital Outcome 8 (DO8), which promotes the vision of building a "digitally inclusive society in ASEAN," the ASEAN-DIWA project seeks to strengthen digital skills and competencies among ASEAN citizens, with a specific focus on empowering women and girls in the technology sector (ASEAN Secretariat 2021).

Problem Statement and Regional Significance

Despite the rapid growth of the digital economy in Southeast Asia, women remain significantly underrepresented in the ICT workforce. As of 2020, women accounted for approximately 22% of ICT roles in Indonesia and up to around 42% in countries like Thailand, with an average female representation of roughly 30-40% across ASEAN member states (Boston Consulting Group 2020). This underrepresentation extends beyond employment figures, as it also covers gaps in indicators like digital access, skills acquisition, and leadership participation (UNESCAP 2022a; Asian Development Bank 2023).

The implications of this gender gap go far beyond individual career outcomes. Multiple research studies have consistently shown that the presence of diverse teams drives innovation more effectively. Moreover, companies with higher levels of gender diversity perform better financially (McKinsey & Company 2020; International Finance Corporation 2019). As ASEAN projects to reach a USD 1 trillion digital economy by 2030, the underutilization of women's skills and perspectives in the ICT sector represents a missed opportunity to enhance regional competitiveness and innovation capacity (UNESCAP 2019; Google, Temasek, and Bain 2022).

The urgency of this issue in the region has been amplified further by the coronavirus (COVID-19) pandemic, which accelerated the process of digital transformation across all sectors, making digital literacy and connectivity foundational to economic participation (Google et al. 2023). Without intentional and inclusive policy responses, the existing gender divide in ICT could widen, excluding millions of women from future opportunities and reinforcing long-standing patterns of economic and social inequality (Asian Development Bank 2021).

Research Objectives and Approach

This research paper, developed as part of the ASEAN-DIWA project, seeks to examine the current state of women's participation in the ICT sector across ASEAN member states. The analysis is grounded in the broader objective of supporting a digitally inclusive ASEAN by identifying both the structural and the practical interventions that can advance gender equality in the digital economy. Specifically, this paper aims to pursue four key objectives, namely:

1. Document the state of women's participation in ICT across ASEAN, highlighting regional patterns and differences;
2. Analyze challenges and barriers preventing women from fully participating in the digital economy;
3. Identify and assess best practices and successful interventions in the region; and
4. Develop policy recommendations for regional and national implementation.

The study adopts desktop research as its methodology, synthesizing secondary data and qualitative insights from various publicly available sources. These include national statistics, policy documents, reports from international and regional organizations, peer-reviewed studies, and documented case studies in the ASEAN region. This approach allows us to have a regional-level understanding of key issues, while also capturing localized contexts that may or may not necessarily influence outcomes at the same time. The study also acknowledges the constraints that are inherent in secondary data analysis, such as data gaps, inconsistencies in gender-disaggregated reporting, and the limited availability of longitudinal indicators.

Structure and Expected Outcomes

This paper is structured to offer both analytical insights and practical guidance for policymakers, development partners, and other stakeholders who are working towards gender-inclusive digital development across the ASEAN region.

To guide the reader through this objective, the paper is divided as follows:

- **Section 2** presents a regional overview of women's participation in the ICT sector by drawing on available datasets, national indicators, and relevant policy frameworks. It outlines current trends and the extent of gender integration in existing ICT strategies.
- **Section 3** examines the range of challenges and systemic barriers preventing women from either entering, retaining, or progressing in ICT careers across ASEAN member states.
- **Section 4** lists down successful interventions and emerging best practices observed from the region in recent years. These initiatives have improved women's digital inclusion in the community or created enabling environments for gender equity in terms of technology use.
- **Section 5** offers policy recommendations for regional and national implementation, which are grounded in both evidence and contextual relevance as provided in this paper.
- Finally, **Section 6** concludes with a synthesis of findings and a forward-looking call for coordinated and multi-stakeholder action across all ten ASEAN member states.

In parallel with this report, the ASEAN-DIWA initiative also includes the development of an interactive regional dashboard to monitor women's participation in ICT and support evidence-based decision-making. Together, the report and dashboard provide a baseline assessment of the current situation, while also offering a repository of strategies and case studies that can inform inclusive policy design. These tools are intended to serve as resources that can be updated over time and used to track progress toward a digitally inclusive ASEAN.



**Despite the rapid growth
of the digital economy in
Southeast Asia, women
remain significantly
underrepresented in the
ICT workforce.**

2

Current Situation of Women in ICT in ASEAN

2.1 Gender and ICT Datasets

Gender-disaggregated ICT data across ASEAN show significant divides in a number of indicators including digital access, skills and participation among others. Drawing on indicators developed by national statistical offices and international databases, this section presents indicators of the current situation of women in the digital economy in the region.

2.1.1 Gender Gap in Internet Access

Access to the internet continues to reflect significant gender disparities across the globe, with women generally having lower connectivity rates than men. According to the International Telecommunication Union (ITU), the global gender gap in internet usage stands at around 8 percent, meaning that 62 percent of men use the internet compared to just 57 percent of women. In Southeast Asia (see Figure 1), the situation varies considerably by country, revealing a mix of progress and persistent exclusion. Indonesia has shown steady improvements over the years, reducing the gender gap in internet access from 8.18 percent in 2015 to 4.20 percent by 2023. While this marks a positive trend, the gap still translates into millions of women being left behind in terms of online access, especially in rural or lower-income areas. Singapore has come very close to achieving digital gender parity, with the gap shrinking from 6.11 percent in 2009 to just 0.34 percent in 2021.

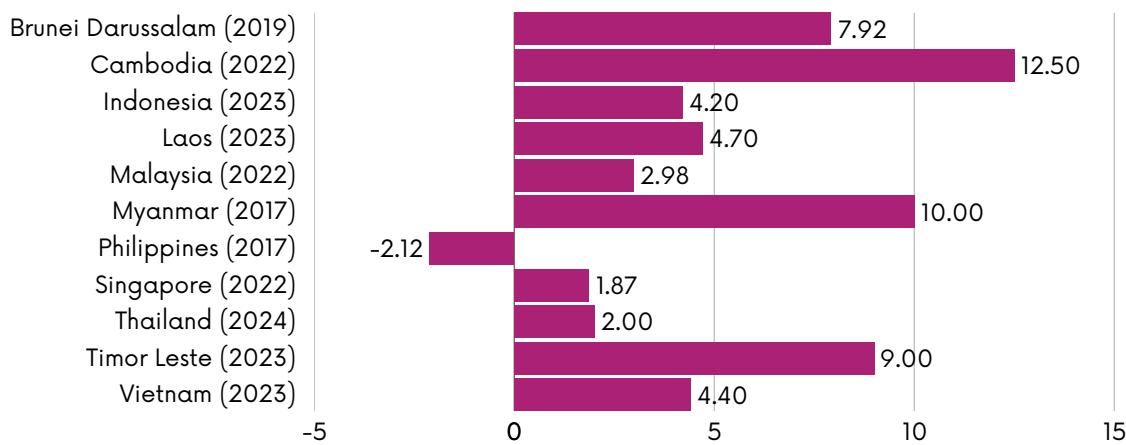
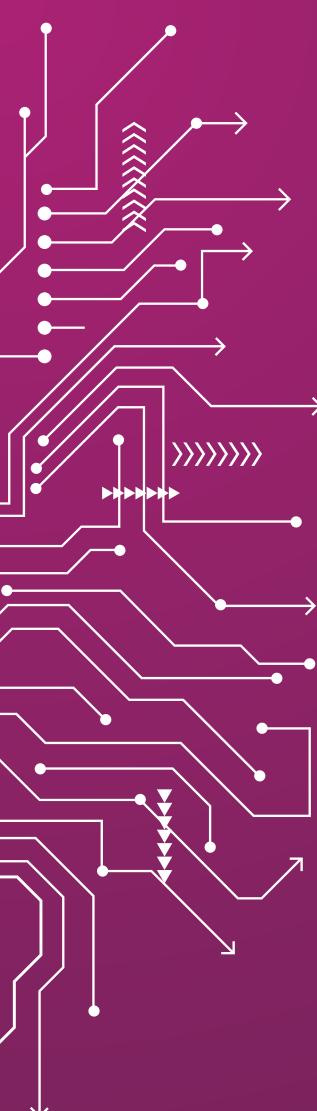


Figure 1. Digital Gender Parity in ASEAN

Source: Authors' construction, based on most recent data available per country



Malaysia has maintained a relatively low gap, generally between 2 to 4 percent, although it spiked to 6.38 percent in 2021 before dropping again. Thailand presents a more mixed picture. Although it showed a female advantage in 2013 and 2014, it has since shifted back to a male advantage of around 1 to 3 percent, indicating uneven progress. At the other end of the spectrum, countries like Brunei and Cambodia still show large disparities. Brunei's gap narrowed from 9 percent in 2016 to 7.92 percent in 2019, but remains high for such a small and technologically advanced country. Cambodia reported a 12.5 percent gap in 2022, among the highest in the region. Timor-Leste's data shows even more alarming trends. In 2023, the reported gender gaps ranged from 5 percent to as high as 21 percent, pointing to severe and unstable inequalities in access. The Philippines stands out as a notable exception, reporting a negative gap of -2.12 percent in 2022, meaning women had greater internet access than men. Laos and Myanmar present difficulties in analysis due to sparse and inconsistent data, with limited entries for the last decade.

The patterns observed in internet access across the ASEAN region make the policy implications relatively direct to the point. Countries that show consistent progress, such as Indonesia, Singapore, Malaysia, and to some extent, Thailand, appear to benefit from deliberate and sustained policy interventions. These include public investment in digital infrastructure, national strategies for digital literacy, gender-sensitive access programs, localized outreach, and regulatory efforts to reduce cost barriers. Their experiences point to the effectiveness of integrated and long-term approaches that actively consider the different ways men and women interact with digital technologies. On the other hand, countries where the gender gap remains high or fluctuates dramatically, including Brunei, Cambodia, and Timor-Leste, require more urgent and better-coordinated responses. These may involve addressing structural inequalities in education and employment, enhancing the affordability of devices and internet subscriptions, and investing in outreach programs for rural and marginalized communities. The Philippines' achievement of a female internet access advantage is especially noteworthy and merits closer examination to understand what contextual factors contributed to this outcome and whether those can be adapted in other contexts.

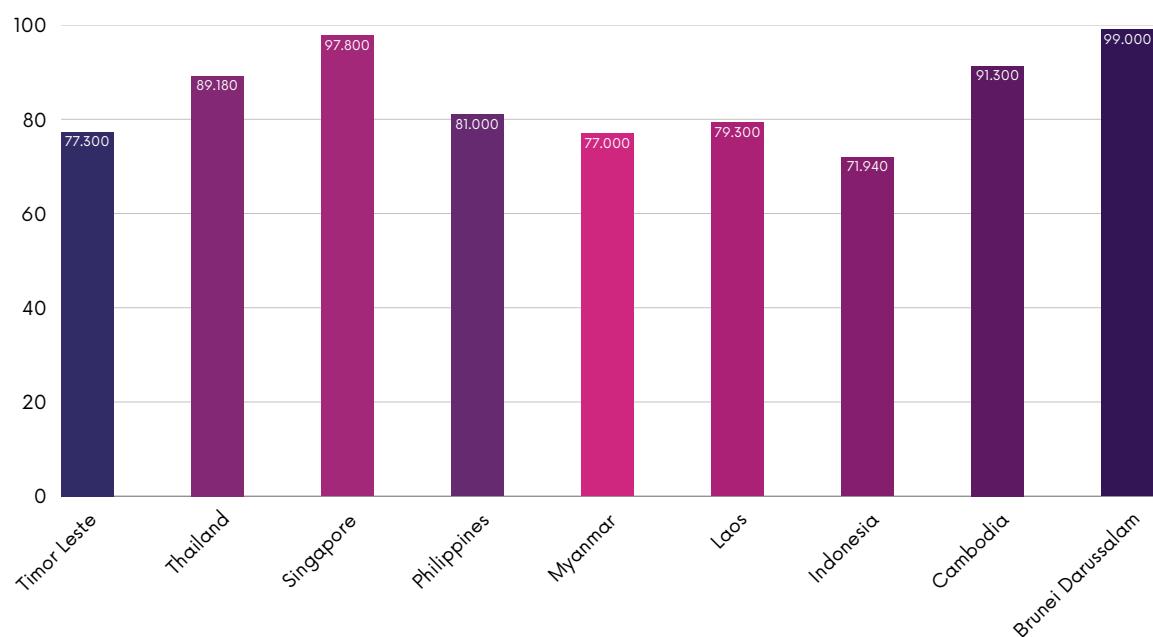
The lack of consistent gender-disaggregated internet access data across ASEAN is a major challenge for effective policymaking. Countries like Laos and Myanmar have limited datasets, while others such as Brunei Darussalam, Cambodia, and the Philippines show gaps in past reporting. Without the presence of regular and standardized data collection, it becomes difficult to track trends, assess progress, or design evidence-based policies. To fix this, national statistical systems must be improved and better aligned with regional efforts to monitor gender and ICT.

2.1.2. Device Ownership

Ownership of mobile phones and digital devices is another key factor determining access to the digital economy. **Without basic access to a phone or computer, individuals are effectively shut out from online services, communication, digital education, and employment opportunities.** The latest data from the region illustrates differences in gendered access to mobile technology.

Brunei Darussalam and Singapore report near-total ownership rates for both genders, ranging from 92 to 99 percent. Gender gaps in these two countries are minimal and have remained consistent over time. These high levels of device ownership reflect strong infrastructure, high household income, and possibly a more gender-equal approach to technology use and education. Thailand, too, has achieved nearly perfect parity between men and women in mobile ownership from 2022 to 2024, with gender gaps never exceeding half a percentage point. These countries suggest that parity is possible with sustained investment and inclusive policy design.

Figure 2. Percentage of Device Ownership by Females



Source: Authors' construction, based on most recent data available per country

Indonesia tells a different story. Between 2015 and 2023, male phone ownership increased from 63.4 percent to 71.9 percent, while women's ownership in the country went from 50.4 percent to just 62.6 percent. The resulting 9.3 percentage point gap in 2023 is substantial and concerning. It suggests that even as the overall number of users grows, women are still being left behind. Cambodia's 2022 data reveals a similar pattern: 91.3 percent of men owned a phone, compared to 84.8 percent of women. Timor-Leste's limited data also points to large gaps. In one report, 77.3 percent of men had phones compared to only 65.6 percent of women (see Figure 2 above).

In 2019, the Philippines showed that 81 percent of women owned mobile phones compared to 77 percent of men, which contrasts with trends in most ASEAN countries where men typically have higher access. This unusual pattern reflects the country's broader progress in women's digital inclusion and may indicate the influence of supportive local policies, targeted programs, or cultural norms that promote greater access for women in certain segments of the population.

The variation in device ownership across the region shows that access is shaped not only by affordability but also by factors such as education, cultural norms, and the presence of targeted outreach. In countries where women are less likely to own phones, they are also less likely to use the internet, develop digital skills, or pursue careers in the ICT sector. Bridging the gap in device ownership should be a clear policy priority, particularly in places where overall mobile access is high but women continue to face structural barriers that limit their participation.

2.1.3. ICT Training and Skills Development

Access to ICT training and digital skills is key to full participation in the digital world. But in many ASEAN countries, women still face challenges; from enrolling in ICT courses to finishing them and gaining technical skills. These challenges often build up over time, making it harder for women to stay in or benefit from opportunities in the digital economy.

2.1.3.1. Enrolment and Completion

Singapore offers the most complete data over time. Female enrolment in ICT courses has declined steadily from 44.56 percent in 1991 to just 27.63 percent in 2023. In contrast, male enrolment has remained consistently high, accounting for 72.37 percent in 2023. While some years have seen women completing their courses at higher rates than men, for instance, in 2016, when 40.16 percent of ICT course completers were women compared to 33.7 percent men, this trend reversed sharply in 2023. That year, female completion rates fell to 26.36 percent, slightly below male rates. The volatility in female participation suggests that women who do enter ICT training programs may encounter particular challenges during or after enrolment that make it harder to persist over time, across institutions, and across career stages.

2.1.3.2. Skills Acquisition

Beyond formal training programs, skills data shows a consistent gender gap in both foundational and advanced digital tasks. Disaggregated ICT skills data across ASEAN member states clearly illustrates how enrolment and completion disparities translate into significant differences in practical, job-relevant digital competency. Women consistently lag behind men in acquiring core technical and specialized digital skills essential for higher-value ICT roles, as listed below:

Programming and Coding

Programming and coding are essential skills for many ICT jobs. These are the basic tools used in software development, website design, and data work. Across ASEAN, women remain far less likely than men to report experience in this area. In Singapore, only 10.7 percent of women said they had programming skills in 2023. In Malaysia, 16.1 percent of men had these skills in 2021, while only 8.2 percent of women had them in 2019. Brunei Darussalam's 2019 data shows that 27.7 percent of men had programming knowledge, though comparable data for women is unavailable. The Philippines offers a related example, where only 9.1 percent of women surveyed in 2019 said they could create digital presentations, which is a much simpler task than programming or coding but still one that reflects digital confidence. These low rates point to gaps in education, access, and encouragement. When women lack early opportunities to learn basic coding, it becomes harder for them to pursue advanced ICT careers later on.



Using Spreadsheet Formulas

Knowing how to use formulas in spreadsheets is a basic requirement in many office and technical jobs. It is not a complex skill, but it requires training and exposure. Women across ASEAN report lower rates of spreadsheet knowledge than their men counterparts. In Singapore, 41.3 percent of women said they could use formulas in 2023. In Malaysia, 43.9 percent of men said the same in 2021. In the Philippines, only 7.2 percent of women had this skill in 2019. This gap means that many women may be excluded from even basic administrative and analytic roles. It also reflects wider patterns in training and education, where girls and women may not be given the same encouragement or access to practice with tools like spreadsheets.



Connecting and Installing Devices

This skill includes tasks like setting up printers, connecting modems, or configuring devices. This might be basic but it is considered to be one of the most important parts of working with technology. In Singapore, only 35.9 percent of women in 2023 said they knew how to do this, compared to 75.5 percent of men. That is a very large gap. Without these skills, it is harder to become confident with technology or to take on jobs in support, setup, or hardware maintenance. These are everyday digital tasks that can open the door to other types of learning. When women are missing from these areas, it limits their participation across the ICT field.



Finding, Downloading, and Installing Software

Being able to install and manage software is a basic digital skill. It affects how people work with tools, update systems, and control their digital environments. In Singapore, 57.9 percent of women had this skill in 2023. In Malaysia, 55.9 percent of men had it in 2021. This might seem like a narrow gap, but not all countries are doing as well. In the Philippines, only 10.5 percent of women in 2019 said they could do this. Without this skill, it becomes difficult to use many online learning tools or to work in digital jobs that require some independence with technology.



Transferring Files

Transferring files, whether by email, USB, or cloud storage, is another simple but necessary skill in most office and ICT jobs today. In Singapore, 54.3 percent of women had this skill in 2023. Men in other countries often report higher rates. For example, 62.1 percent of men in Malaysia in 2021. File transfers are a routine part of digital life, and the gap here reflects broader differences in digital confidence and access. While this is not a highly technical task, the fact that it still shows gender differences points to everyday barriers that should not be overlooked.

Creating Presentations

Creating digital presentations is a basic skill used in education, office work, and professional communication. It reflects a person's ability to organize information, use digital tools, and present ideas clearly. In Singapore, 44 percent of women reported knowing how to create presentations in 2023. This is a relatively moderate figure but still leaves a large portion of women without this common skill. In contrast, data from the Philippines in 2019 is much more concerning: only 9.1 percent of women said they could create presentations. This wide variation between countries shows how uneven digital training opportunities are in the region.

“

While the gender gaps in simpler digital tasks, such as copying and pasting content or sending emails with attachments, are generally smaller and, in some cases, even reversed, the situation is very different when it comes to more advanced skills.

”

For example, in Brunei Darussalam, women reported relatively high rates of proficiency in basic functions like copy and paste, suggesting that they are not entirely excluded from digital interaction. However, the consistency of these basic skills does not extend to more complex, technical, or infrastructure-related tasks.

Across ASEAN, women continue to report significantly lower proficiency in specialized areas such as programming, device setup, and technical software management. These skill deficits are not only persistent but also critical because they are directly linked to access to better-paying and more secure jobs in the ICT sector. Without these competencies, women face major obstacles in progressing into mid-level and senior technical roles. This reinforces occupational segregation and limits women's influence in shaping digital systems, tools, and policy at higher levels of decision-making. Addressing this skills gap is essential if women are to participate fully in the digital economy and benefit equally from emerging opportunities.



2.1.3.4. Workforce Participation

Workforce participation data sheds light on the proportion of women employed in the ICT sector across ASEAN member states. This data allows us to determine the level of roles designated in areas such as computing, engineering, software development, telecommunications, and other technical fields. This indicator also provides insight into gender inclusion in a high-growth sector that plays a central role in national digital transformation. High rates of female representation suggest stronger integration of women into the digital economy, while low rates reflect ongoing barriers that can restrict innovation, limit equitable access to digital opportunity, and reduce the diversity of perspectives shaping technological development. Making sure that women have a strong presence in the ICT workforce is not only a matter of fairness, but it is also essential for building an inclusive, relevant, and competitive digital ecosystem across the region.

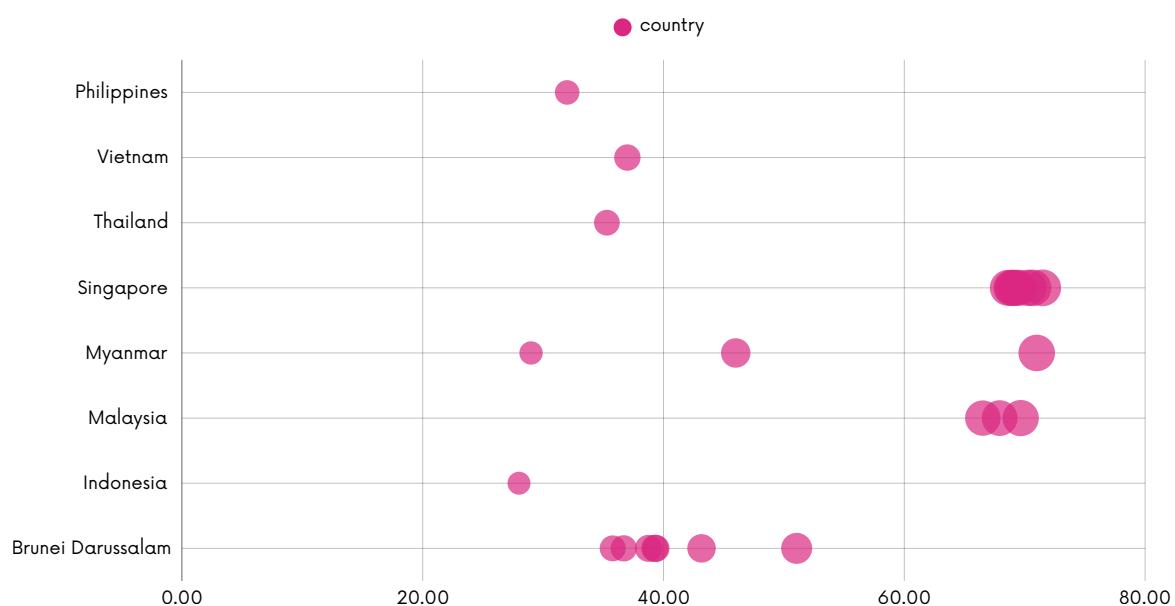
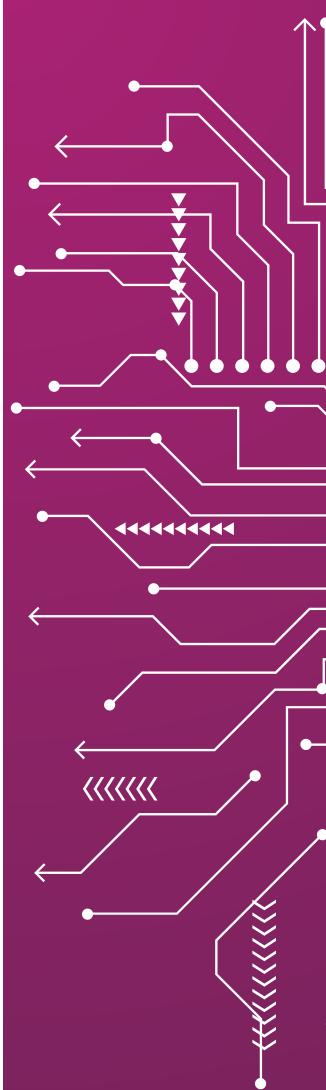


Figure 3. Proportion of Women in the ICT Sector by ASEAN Countries

Source: Authors' construction, based on most recent data available per country

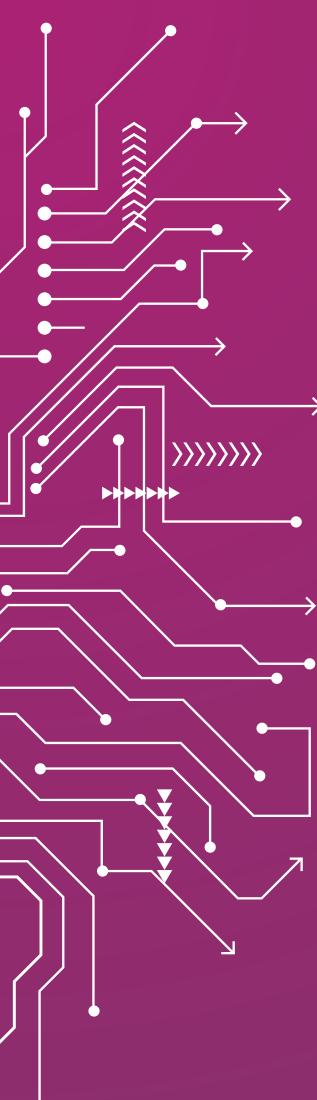
The data presents significant variation across countries. Singapore reports the highest and most consistent levels of female participation in the ICT sector, with women making up between 68.6 percent (2023) and 79.3 percent (2021) of the workforce over recent years. These figures may reflect the country's supportive education system, as well as policies that promote gender equality, and broader cultural acceptance of women in professional technology roles. Malaysia follows a similar pattern, with women comprising 66.52 percent of the ICT workforce in 2022 and 67.92 percent in 2023, peaking at 69.67 percent in 2021. These figures suggest a relatively strong track record in engaging women in tech-related employment, though additional disaggregation would be needed to evaluate participation in specific roles or levels of seniority.



In contrast, Brunei Darussalam shows a declining trend in women's ICT employment. While female representation stood at 51.06 percent in 2017, it dropped to 35.78 percent by 2020 and only slightly recovered to approximately 39 percent by 2022. These fluctuations point to a lack of continuity or stability in support systems that enable women's long-term engagement in tech careers. Myanmar's available data highlights disparities across ICT sub-sectors. For instance, women accounted for only 29 percent of roles in computing and programming, but 71 percent in engineering and technical services, which indicates a significant variation in gender inclusion even within the broader ICT classification and making a singular assessment difficult.

Other countries, such as Thailand (35.3% in 2020), Vietnam (37% in 2019), and the Philippines (32% in 2019), report figures below the 40 percent mark. These consistently low numbers underscore the need for targeted efforts to increase women's participation. Indonesia presents the lowest reported figure, with only 28 percent of ICT roles held by women in 2020. This suggests that systemic barriers, including limited access to training, gender stereotypes, and workplace bias, continue to prevent women from entering and remaining in tech professions. Without meaningful policy shifts and structural change, these trends are unlikely to improve.

Compounding these challenges is a broader issue of data availability. Out of the 10 ASEAN member states, only eight have published data on women's participation in the ICT workforce. Cambodia, Timor-Leste, and Laos have not released figures, and among the countries that do report, five were able to provide data for only a single year. This restricts the ability to conduct meaningful year-on-year comparisons or long-term trend analysis. Moreover, discrepancies in how ICT occupations are defined complicate cross-country comparisons. For instance, Singapore's data includes a broader category labeled "media and tech," which may extend beyond core ICT occupations and affect direct benchmarking. The lack of standardized, disaggregated, and longitudinal data remains a serious barrier to effective policy making. To accurately assess progress and design well-targeted interventions, ASEAN governments need to invest in more consistent and detailed data collection systems that reflect the realities of women's engagement in the digital workforce.



2.1.6. Data Deficit

The persistent lack of standardized, comparable, and longitudinal gender-disaggregated ICT data across ASEAN member states presents a major barrier to evidence-based policymaking. This data gap is not limited to one aspect of the digital landscape alone. In fact, it spans multiple dimensions and reveals a structural weakness in regional data infrastructure. Workforce statistics are especially limited, with only eight out of the ten ASEAN countries publishing any data on women's representation in ICT employment. Of these, only five countries in the region provide a single year of data, which severely restricts the ability to identify trends, monitor change over time, or evaluate the effectiveness of interventions. Compounding this problem are the inconsistencies in definitions of what constitutes an "ICT role" that vary across national reporting systems. Singapore, for instance, includes broader categories like "media and tech," which complicates direct comparisons with countries that apply narrower criteria.

Skills and training data are similarly patchy. Very few member states report consistent time-series data on enrolment, course completion, or technical skill acquisition disaggregated by gender. Without these indicators, it becomes difficult to understand where and when women are being excluded from the digital talent pipeline. In contrast, data on access and device ownership has improved in both coverage and frequency. However, inconsistencies in reporting remain widespread, as observed in countries like Laos, Myanmar, and Brunei Darussalam, especially in the period after 2019, making trend analysis and meaningful cross-country benchmarking difficult. Even in countries that do provide some disaggregated data, the absence of more granular insights limits the capacity to interpret outcomes in a nuanced way. For example, Myanmar's limited data points show that women represent only 29 percent in computing roles but 71 percent in engineering, which is a striking disparity hinting at the diversity of gender dynamics within the broader ICT ecosystem. Yet such variations are rarely captured elsewhere, as most national datasets report only top-line figures that conceal critical subfield differences. This lack of granularity further weakens the ability to diagnose sector-specific bottlenecks or tailor interventions to the needs of particular segments of the female population.

In sum, **the absence of reliable, comprehensive, and standardized data across ASEAN countries remains a foundational challenge.** It undermines the ability of governments, researchers, and development partners to track progress, identify gaps, and design targeted, responsive policies. If the goal of inclusive digital transformation is to be achieved, closing this data deficit must be a top priority. Investment in national statistical systems, adoption of common definitions, and coordinated regional efforts to ensure regular and gender-sensitive ICT data collection will be essential to drive informed action and achieve equitable outcomes in the digital economy.

Gender & ICT Datasets

Digital Divide Analysis Across ASEAN Member States

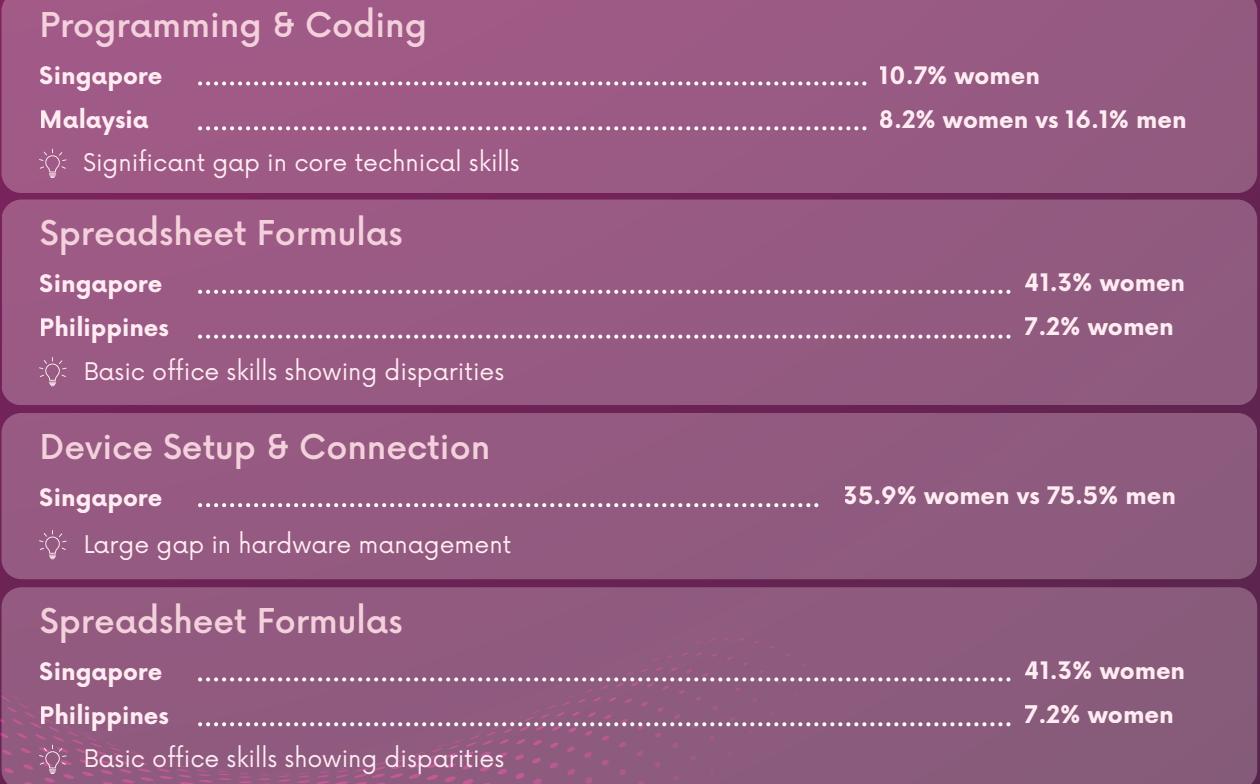
Internet Access Gender Gaps



Mobile Device Ownership



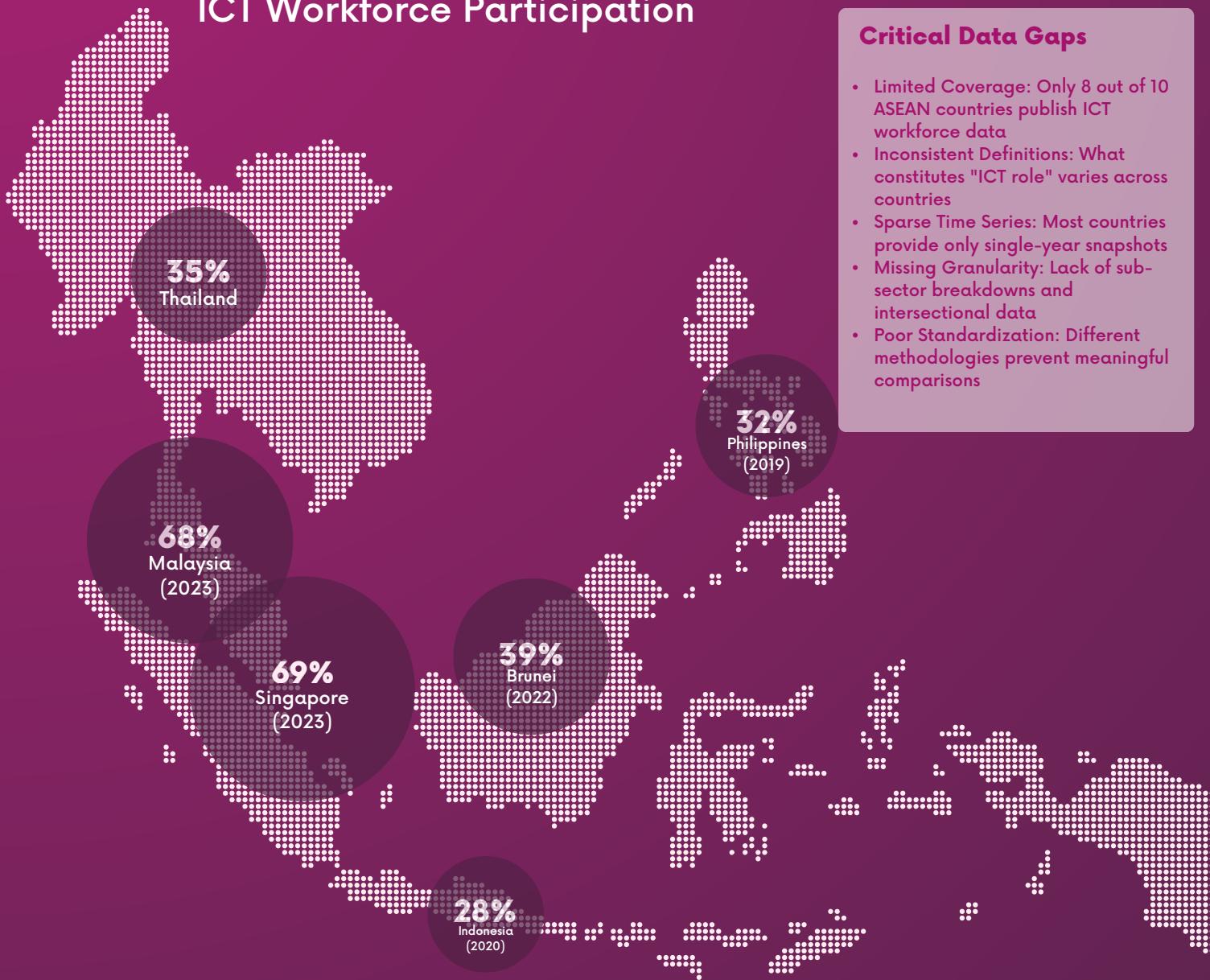
ICT Skills Gender Disparities



Gender & ICT Datasets

Digital Divide Analysis Across ASEAN Member States

ICT Workforce Participation



Key Insights from the Data

Progress is Uneven: While some countries like Singapore achieve near-parity in internet access, others like Cambodia and Timor-Leste show alarming 10-20% gaps.

Data Infrastructure Weakness: The lack of standardized, longitudinal gender-disaggregated data hampers evidence-based policymaking across the region.

2.2 Policy Indicators

2.2.1. Comprehensive Gender Equality Policies

The adoption of the **Universal Declaration on Human Rights (UDHR)** in 1948 has led to the recognition of gender equality as a fundamental human right; setting the stage for national and international efforts to eliminate discrimination based on sex and gender. Countries in Southeast Asia became part in shaping this global commitment by ratifying key international treaties and agreements such as the **Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)**, which was adopted by the United Nations (UN) in 1979. A separate optional protocol was put into effect later on in 1999 to strengthen its implementation by allowing individuals or groups to submit their complaints directly to the Committee on the Elimination of Discrimination Against Women when their rights under the convention are violated. Among the first countries in the ASEAN region to ratify the agreement were Laos PDR and the Philippines. Table 1 lists down the year when each member state ratified the CEDAW.

At the regional level, the ASEAN established the Sub-committee on Women in 1975 to better promote the welfare and advancement of women in all member states (National Commission on the Role of Filipino Women 2005, 5). This body would later become the **ASEAN Women's Programme** and eventually the **ASEAN Committee on Women (ACW)**. The committee has played a critical role in developing various regional frameworks to support gender mainstreaming across sectors such as education, health, labor, and governance across the region. Every year, the ACW holds regular meetings to review progress and coordinate gender-related initiatives across ASEAN member states. Since its creation, the ACW was able to develop and adopt a number of regional mechanisms that aim to promote and protect the rights of women in the region. These include the **ASEAN Regional Plan of Action on the Elimination of Violence Against Women (RPA on EVAW)** (2016), which provides concrete measures for the prevention, protection, and support services for women and girls experiencing violence; and the **ASEAN Gender**

Country	Year of CEDAW Ratification
Philippines	1981
Lao PDR	1981
Thailand	1985
Vietnam	1982
Indonesia	1984
Malaysia	1995
Singapore	1995
Myanmar	1997
Cambodia	1992
Timor Leste	2003
Brunei Darussalam	2006

Table 1. Year of CEDAW Ratification by ASEAN Countries

Source: Authors' construction, based on most recent data available per country

Mainstreaming Strategic Framework (2021), which seeks to institutionalize gender equality efforts across the three ASEAN Community pillars.

At the national level on the other hand, countries across the region have developed a variety of gender equality laws and policies to turn global commitments like CEDAW into real actions that benefit women and girls. These laws are often part of broader national gender strategies that focus on either protecting women's rights, preventing violence against women and children (VAWC), or expanding access to education, jobs, and political representation

Singapore was among the earliest in the region to act by enacting the Women's Charter in 1961 to address issues such as family violence and maintenance rights. Indonesia followed with Law No. 7/1984, which ratified CEDAW, and later introduced Presidential Instruction No. 9/2000 on gender mainstreaming in national development. Malaysia passed the Domestic Violence Act in 1994 and revised its National Policy on Women in 2009 to further align with gender equality principles. Lao PDR adopted the Law on the Development and Protection of Women in 2004 to ensure women's participation in national development and safeguard their rights. Cambodia passed the Law on the Prevention of Domestic Violence and the Protection of Victims in 2005, which works alongside its Gender Mainstreaming Action Plan. Viet Nam institutionalized its gender commitment through the Law on Gender Equality in 2006, promoting equal rights in politics, labor, and education. In 2009, the Philippine Congress passed the Magna Carta of Women (Republic Act No. 9710), which created a comprehensive framework to enhance the welfare of Filipino women. Thailand advanced its legal protections through the Gender Equality Act B.E. 2558 in 2015, which prohibits all forms of gender-based discrimination and established the Committee to Promote Gender Equality (CPGE). Myanmar developed its National Strategic Plan for the Advancement of Women (2013-2022) and has drafted, though not yet enacted, the Protection and Prevention of Violence Against Women Law partly due to the coup d'état in 2021. More recently, Singapore introduced the White Paper on Singapore Women's Development in 2022 to chart a modern roadmap for gender equality across work, caregiving, and safety.

Table 2 below summarizes the extent to which key gender equality laws and national policy frameworks in the 10 ASEAN member states address specific aspects of women's rights. These include protections and provisions related to political participation, protection from violence, labor and employment rights, access to education, health and reproductive rights, and the presence of institutional mechanisms for implementation and monitoring. As shown in the table, **most countries have integrated legal safeguards for women's participation in the workforce and protection from violence**. However, notable gaps remain in the coverage of health and reproductive rights, particularly in countries like Malaysia, Cambodia, and Brunei Darussalam, where these issues are either insufficiently addressed or not explicitly covered in the current legal instruments. Brunei Darussalam, in particular, shows limited legal integration across most dimensions, as it is not a party to CEDAW.

Table 2. Legal Review Matrix of Gender Equality Laws in ASEAN Member States

Country	Law(s)/Policy Framework(s)	Year Enacted	Political Participation	Protection from Violence	Labor & Employment Rights	Access to Education	Health & Reproductive Rights	Institutional Mechanisms
Singapore	Women's Charter; White Paper on Singapore Women's Development	1961; 2022	✓	✓	✓	✓	✓	✓
Indonesia	Law No. 7/1984 (CEDAW Ratification); Presidential Instruction No. 9/2000 on Gender Mainstreaming	1984; 2000	✓	✓	✓	✓	✓	✓
Malaysia	Domestic Violence Act; National Policy on Women	1994; 2009	✓	✓	✓	✓	✗	✓
Lao PDR	Law on the Development and Protection of Women	2004	✓	✓	✓	✓	✓	✓
Cambodia	Law on the Prevention of Domestic Violence; Gender Mainstreaming Action Plan	2005	✗	✓	✗	✓	✗	✓
Vietnam	Law on Gender Equality	2006	✓	✓	✓	✓	✓	✓

Philippines	Magna Carta of Women (RA 9710)	2009	✓	✓	✓	✓	✓	✓
Thailand	Gender Equality Act B.E. 2558	2015	✓	✓	✓	✓	✓	✓
Myanmar	National Strategic Plan for the Advancement of Women; Draft Protection and Prevention of Violence Against Women Law	2013-2022 (draft)	✓	✓	✓	✓	✓	✓
Brunei Darussalam	National Council on Social Issues Plan of Action; Women Development Policies	N/A	✗	✗	✗	✗	✗	✗

Source: Authors' construction, based on most recent data available per country

Figure 4 illustrates the Gender Inequality Index (GII) scores globally for the year 2013, highlighting the relative standing of ASEAN countries in terms of gender-based disparities in reproductive health, empowerment, and economic participation (IMF 2013). It highlights that while legal reforms have been widespread throughout the region, gender disparities remain deeply entrenched in some countries. Singapore and Malaysia, for instance, fall within the lower GII range, which reflects comparatively stronger institutional support for gender equality and better outcomes in health and education. Meanwhile, countries in the Mekong Delta region (i.e., Cambodia, Myanmar, and Lao PDR) are shaded in red, indicating more pronounced gender inequalities, especially in socio-economic and political representation.

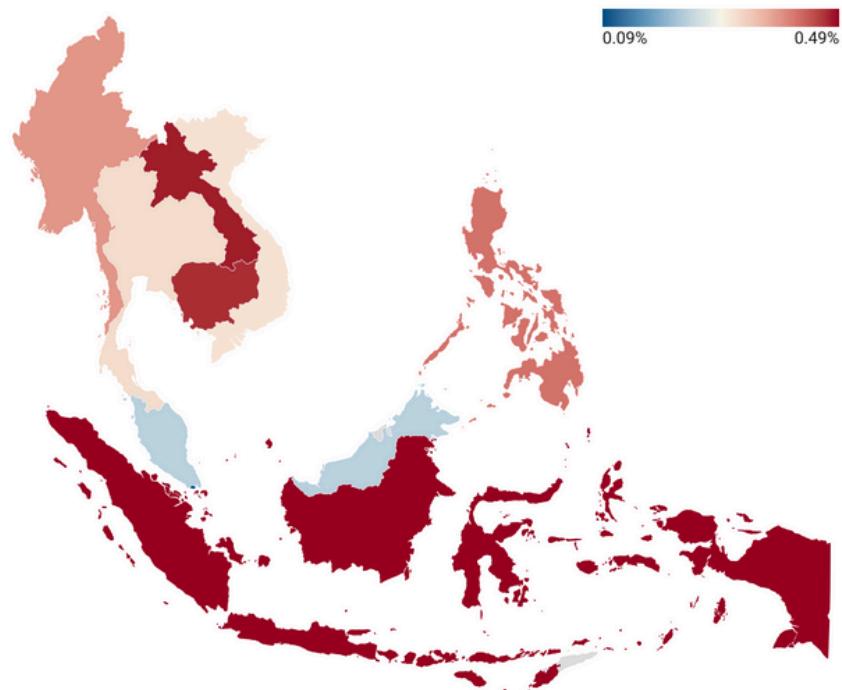


Figure 4. Gender Inequality Index (GII) in the ASEAN Region, 2013

Source: Authors' construction based on data from the International Monetary Fund (2013)

2.2.2. Policy Integration

As mentioned in the previous section, ASEAN member states have increasingly recognized the need to mainstream gender in their ICT and digital economy policies. In 2021, it adopted the ASEAN Digital Masterplan (ADM) 2025 as part of the organization's plan to build a more "digitally inclusive" ASEAN in the future. It aims to make digital technologies accessible to all, including women and other traditionally marginalized groups. Complementing the ADM is the ASEAN's Gender Mainstreaming Strategic Framework 2021-2025, which calls for gender to be integrated across all policy areas. It recognizes the need for gender-responsive measures in the digital sector to counter the underrepresentation of women in technology.

At the national level, many countries in the region have incorporated gender considerations into their ICT plans and strategies, though approaches vary. At least five ASEAN member states (Brunei, Malaysia, the Philippines, Thailand, and Singapore) have dedicated national digital economy and ICT strategies, and these often acknowledge the importance of inclusivity and women's participation (Nengsi, 2019). For instance, the Philippines has institutionalized gender mainstreaming in all policy domains, including the ICT sector, through the **Gender and Development (GAD)** framework. The **Magna Carta of Women** mandates all national and local government agencies in the country to allocate at least 5% of their total budget to GAD-related programs. This institutional arrangement ensures that gender-responsive planning and budgeting are embedded in ICT policymaking and service delivery.

In 2022, the Department of Information and Communications Technology (DICT) launched the **Digital Innovation for Women Advancement (DIWA)** program to boost women's involvement in ICT and use technology for women's empowerment in the Philippines (see Figure 5). Singapore, on the other hand, initiated the **SG Women in Tech** program in 2019 as a public-private partnership (PPP) to attract, retain, and develop female tech talent, aligning with the government's Smart Nation and digital economy agenda (IMDA 2019).



Figure 5. Logo of the DIWA Program (Digital Innovation for Women Advancement), launched by the Department of Information and Communications Technology (DICT) in partnership with the Office of the Undersecretary for ICT Industry Development (OUIID) and the ICT Industry Development Bureau (IIDB).

Source: Department of Information and Communications Technology

2.2.3. Education Initiatives

Various public and private stakeholders across the ASEAN region have rolled out numerous initiatives to build ICT skills and education pathways for women and girls in their respective countries. The region performs relatively well in girls' basic STEM education. Countries like the Philippines and Thailand have even seen girls outperforming boys in school STEM assessments based on the 2018 Program for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD). However, the challenge has been sustaining this advantage into higher education and ICT careers, as social biases and lack of support often deter women from pursuing STEM at advanced levels (ASEAN, 2023). In order to tackle this issue, governments from all ASEAN member states are investing in formal and informal education programs tailored for females.

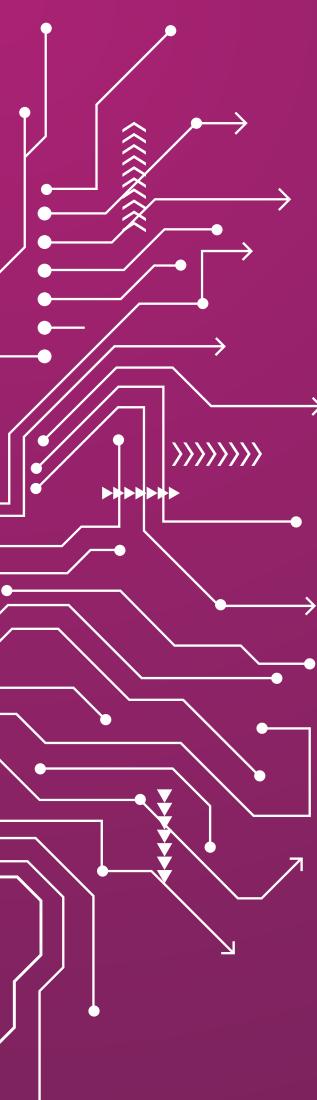
Many countries, for instance, have started to revise their curricula and launched scholarship schemes to encourage women in STEM fields. For example, Malaysia's Education Blueprint emphasizes increasing female enrollment in engineering and ICT programs (*ibid.* 2023). Several ASEAN countries have also partnered with foreign governments on scholarship initiatives such as the ASEAN-UK SAGE "Women in STEM" Scholarship program (launched in 2021), which offers fully funded master's degrees in the United Kingdom to women from every ASEAN member state. Domestic scholarship programs also exist as well. Indonesia and Viet Nam have offered women-focused ICT scholarships in fields like data science and computer engineering (OECD 2021). Such initiatives help send a signal that women are welcome in technical fields, and begin to chip away at the financial and perceptual barriers to women's STEM education.



Figure 6. Young Malaysian Students Reading Malaysia Education Blueprint 2013-2025

Source: Mashable Southeast Asia, 2020

Beyond formal education, training programs and bootcamps have emerged in recent years to equip women and girls with practical tech skills. These range from government-led digital literacy campaigns to private sector and NGO projects. Many countries across Southeast Asia celebrate International Girls in ICT Day, an ITU initiative, where workshops and hackathons are held to spark girls' interest in coding and IT careers. For example, in 2023 the Philippine Government, through DICT, hosted ASEAN Girls in ICT Day, featuring coding bootcamps and mentoring sessions for girls from across the region (Girls in ICT Asia-Pacific 2023). In Cambodia, Sisters of Code was established by IT STEP Academy Cambodia, a non-profit, to provide a safe, female-friendly learning environment and mentorship for schoolgirls. Similar initiatives like TechGirls in Viet Nam and Girls in Tech chapters in Indonesia and Thailand provide tech training alongside confidence-building for young women. These programs emphasize that technology is not a "male-only" profession, and pair learners with female mentors to combat the stereotype that "boys are naturally better at tech" (UNICEF 2023). Evaluations suggest that such approaches (e.g. using female role models, all-girl coding classes, and project-based learning tied to real-world problems) can significantly improve girls' self-efficacy in ICT subjects compared to traditional learning methods (Isaacson et al. 2020).



Global tech firms have also invested in the region in recent years as well. Google's philanthropic arm, for example, launched a "Women Will" program in multiple ASEAN countries to train women in online skills, entrepreneurship, and leadership (Google 2020). Microsoft and IBM have also supported coding camps for girls and scholarships for women in AI and data science. The ASEAN Foundation also runs several programs targeting youth digital skills with an explicit gender inclusion lens, such as the ASEAN Data Science Explorers program, ensuring that young women benefit equally from regional tech opportunities. These multi-stakeholder initiatives acknowledge that building a strong pipeline of women in ICT requires engagement at all levels of the society (e.g., schools, universities, community programs, private industries, government), and that success depends on tackling both skills and social encouragement

2.2.4. Workplace Policies

The development of a gender-responsive workplace is grounded on the broader global movement for gender equality and decent work. Central to this movement is the recognition that the economic empowerment of women is not only a matter of fairness and dignity, but also as a strategic driver of inclusive growth and development. To put it simply, workplace gender equality entails making sure that both men and women have equal access to opportunities and resources in employment regardless of their sex, gender identity, or reproductive role (Gregory 2003). This includes addressing disparities in recruitment, retention, promotion, occupational safety, pay, and protection from all forms of harassment and discrimination in the workplace (i.e., Cohen, and Deterding 2009; Peterle and Rau 2017; Campero and Fernandez 2019).

The International Labour Organization (ILO) has long emphasized the importance of promoting gender-responsive labor standards and inclusive work environments, particularly in rapidly evolving sectors like ICT. Since its founding in 1919, the ILO has produced a series of legally binding conventions, as well as non-binding recommendations that are aimed at promoting equal treatment and non-discrimination in employment. Some of these key instruments include ILO Conventions No. 100 on Equal Remuneration (1951), No. 111 on Discrimination in Employment and Occupation (1958), and No. 156 on Workers with Family Responsibilities (1981), among others (Oosterveld 2000). Over the years, the concept of gender equality at work has expanded to include the recognition of unpaid care work, the value of flexible working arrangements, and the right to a workplace free from violence and harassment. In 2019, the ILO's adoption of the ILO Convention No. 190 on the Elimination of Violence and Harassment in the World of Work marked a significant milestone by acknowledging that safe and respectful working conditions are an essential part of building gender equality in the workplace (Kocher 2023).

In the case of Southeast Asia, multiple reports have found that gendered digital divide continues to persist in the region. This, despite the number of government-led interventions made prior to and during the digital acceleration spurred by the COVID-19 pandemic. Women still experience lower levels of access to various digital tools, including mobile internet, particularly in low-income and rural areas. Some of the factors that contribute to the persistent exclusion of women from fully participating in the digital economy include socio-cultural norms, unequal caregiving burdens, and limited digital literacy programs available in the area (UNESCAP 2021). Even where access is available, digital engagement is often restricted to lower-value activities such as social media use or informal e-commerce, rather than participation in the more lucrative areas of coding, data science, machine learning, and ICT-enabled formal employment.

2.2.5. Entrepreneurship Support

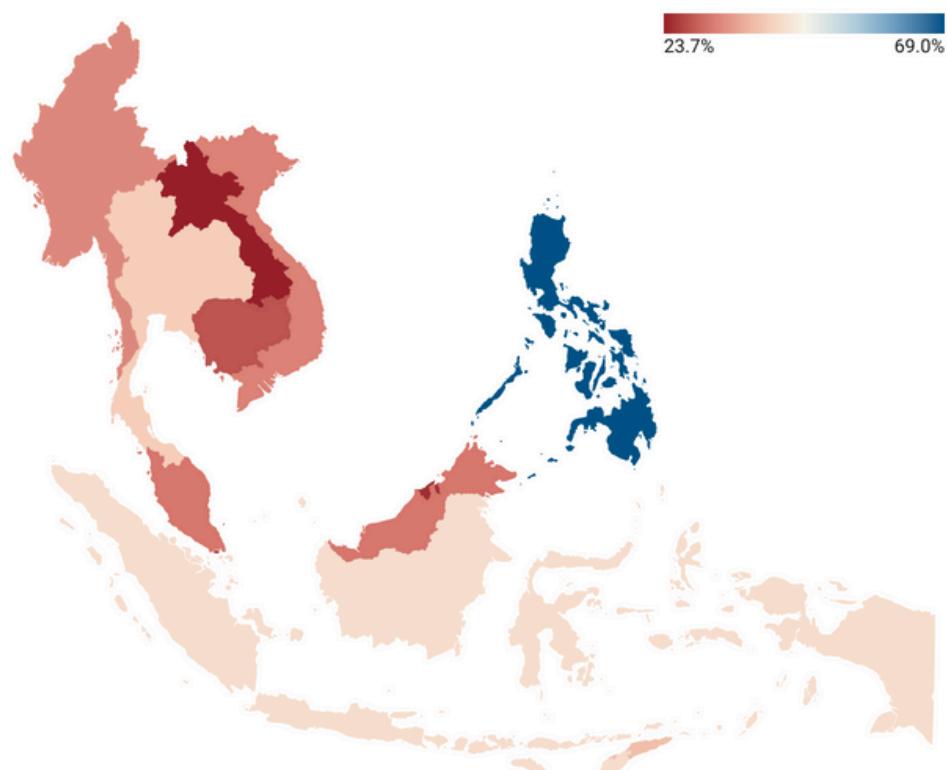


Figure 7. Share of Women Business Owners (% of Total Business Owners), 2021.

Source: Authors' construction based on data from the International Monetary Fund (2013)

Women make up only 33% of businesses worldwide according to the World Bank (2022). This underrepresentation is particularly pronounced in sectors such as technology, finance, and manufacturing, where barriers to entry remain high to this day. Figure 7 above shows the share of female business owners across ASEAN countries, emphasizing the areas where gender disparities are most pronounced. While specific percentages vary by country, the data indicates that women's participation in business ownership within the ASEAN region generally falls below the global average. For instance, countries like Cambodia, Malaysia, Myanmar, and Viet Nam have all report female ownership rates ranging approximately between 20% and 30%.

Despite this trend, it has been a priority across the region to empower women as digital entrepreneurs. For one, it is seen as a way to drive inclusive growth in the digital economy. Governments and private sector partners based in the region have launched a variety of programs to support women's entrepreneurship in the tech and digital sectors. A cornerstone of support is improving women entrepreneurs' digital literacy and capability to leverage technology. An example of this is the Go Digital ASEAN initiative, which is a regional program supported by ASEAN, Google, and the Asia Foundation that trained over 225,000 individuals across ASEAN in 2020-21, with a focus on marginalized groups like women and rural micro, small, and medium enterprises (MSMEs) (Sefrina 2023).

By 2024, Go Digital ASEAN had trained over 140,000 entrepreneurs in digital business skills; 60% of them women from underserved communities (The Asia Foundation 2024). Likewise, the ILO and UN agencies have partnered with tech firms to deliver women-focused digital training. In late 2021 for example, the ILO and Google launched online programs for women entrepreneurs in the Philippines, Thailand, and Malaysia to teach digital marketing and e-commerce skills (ILO n.d.). Such initiatives not only impart technical know-how but also aim to boost women's confidence in using ICT for business, which is an important factor, as studies show women entrepreneurs often underestimate their digital skills.



Figure 8. Go Digital ASEAN's initiative to empower individuals and communities towards digital literacy

Source: Go Digital ASEAN

Several countries have also established their own women entrepreneur "academies" or incubator-linked training. Singapore's SG Women Entrepreneurs initiative, for instance, offers capacity-building workshops and an online academy through the Singapore Council of Women's Organisations, covering topics from coding to venture pitching. In Indonesia, the Ministry of Women's Empowerment and Child Protection (PPPA), in collaboration with the UNDP, has run the Women in Digital Entrepreneurship course series to help women-led MSMEs go online. These efforts reflect a broad consensus that closing the digital skill gap for women entrepreneurs is essential for them to compete in an increasingly online marketplace.

Improving women's access to finance and entrepreneurship networks is another focus area. Women in ASEAN traditionally face greater hurdles in obtaining capital due to lack of collateral, discriminatory lending practices, or smaller professional networks. All ten ASEAN member states now implement some form of national financial inclusion strategy, many of which include a gender focus (ASEAN 2022). Some have even introduced women-specific credit programs to complement the strategy. For example, Viet Nam's VPBank created a tailored loan package for women-owned small and medium enterprises (SMEs). (UNESCAP 2022a: 96-97). Indonesia has expanded its Kredit Usaha Rakyat program, which is a popular MSME loan scheme launched by its government; and relaxed collateral requirements, which has benefited many women entrepreneurs by allowing alternative forms of credit security (Sefrina 2023). In addition, legal reforms are under discussion in several countries to ensure women can equally access credit and property, such as gender-equal inheritance laws and anti-discrimination regulations for lenders (UNESCAP 2022a: 19). Efforts are also underway to connect women entrepreneurs with equity financing and inclusive policy backing. Networks such as the Inclusive Women Venture Capital Initiative have begun providing seed funding and mentorship to qualified women-led startups in the region.



Figure 9. Female start-up leaders at a technology event in the Philippines

Source: Mashable Southeast Asia, 2020

Business incubators and accelerators tailored for women are also emerging in recent years. Across ASEAN, women remain underrepresented in mainstream tech incubators. Previous literature has found that female founders often represent only a small fraction of participants in startup programs, meaning they miss out on mentoring and investor networks that male entrepreneurs access (UNESCAP 2022: 83). To counter this, a few women-centric incubators have been established. For instance, Cambodia's WE Act program, supported by the U.S. Agency for International Development (USAID), operates the country's only incubator dedicated to women, helping female micro-entrepreneurs scale up and enter new markets. In Malaysia, the Malaysian Global Innovation and Creativity Centre (MaGIC) has run a Women Entrepreneurs Accelerator that provides coaching, business clinics, and pitching opportunities for women founders (Abudheen 2018).

Similarly, the Women in Tech Incubator in the Philippines offers a package of mentorship, product development support, and seed grants to female-led tech startups. These targeted incubators often incorporate training on soft skills and confidence-building and women mentor networks to address gender-specific needs. They also actively link participants to angel investors and venture capital that are interested in women-led ventures, which is a crucial step in the process given that women entrepreneurs globally receive a disproportionately small share of venture funding due to prevailing gender norms.

Finally, mentorship programs and networks play a vital role in supporting women in ICT entrepreneurship. ASEAN's private sector and civil society have created an array of women entrepreneur networks, such as Women in Tech Asia, She Loves Tech, and national women's business councils, which offer a combination of peer support, mentoring by experienced entrepreneurs, and regional pitch competitions for female-founded startups. These networks help break the isolation that women in male-dominated tech industries often feel. For example, the Singapore Council of Women's Organisations runs a BoardAgender initiative linking women entrepreneurs with seasoned business mentors and conducts networking events and "women in start-ups" pitch forums (UNESCAP 2022: 70). Similarly, various women's entrepreneurial networks in Thailand, Indonesia, and the Philippines host regular mentorship circles and matchmaking events with investors. Through such inclusive platforms, successful female tech founders and executives from across the region are actively guiding younger women; a practice that not only transfers critical skills and growth opportunities with like-minded women, but also challenges social perceptions by consistently showcasing role models in the ICT community.

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Thresholds of digital inclusion

- 1 Access to infrastructure
- 2 Digital literacy
- 3 Extent of digital tool use

2.2.6. Digital Inclusion

Digital inclusion can be defined as the manner in which all individuals, regardless of their age, sex, or ethnicity, have the ability to access digital technologies, possess the necessary skills to use them meaningfully, and enjoy the socio-economic benefits that these technologies bring to the community (Van Deursen and Van Dijk 2014; Nguyen 2022). Previous literature have explored the thresholds of digital inclusion by examining key dimensions such as access to infrastructure (e.g., broadband internet, mobile devices), digital literacy (i.e., the ability to use and navigate digital tools effectively), and the extent to which individuals can use these digital tools to improve their economic and social well-being (Adam and Dzang Alhassan 2021).

A number of studies have also highlighted the digital divide that persists along lines of gender (Acilar and Sæbø 2023), income (Martin and Robinson 2007), and education (Gorksi 2005). In many developing countries, women are less likely than men to own digital devices or have regular access to the internet due to various institutional, social, and cultural barriers (Antonio and Tuffley 2014). This trend is much worse in remote areas where gender education is limited.



Source: ASEAN Digital Masterplan Adopted, Vietnam+

In the context of the ASEAN region, digital inclusion has emerged as both an opportunity and a challenge, as member states push for greater digital transformation under frameworks such as the **ASEAN Digital Masterplan (ADM) 2025**. Under the ADM, member states have rolled out a series of national programmes to make sure that no one is left behind in the digital economy (Son 2022). Brunei's **Digital Economy Masterplan 2025** complements this vision by targeting 90 percent population internet penetration and 100 mbps broadband in all government offices by 2025 (Digital Economy Council of Brunei Darussalam 2020). In Malaysia, its **Digital Economy Blueprint** has allotted at least RM70 billion (USD16.6 billion in 2020 values) towards digital investments (Economic Planning Unit - Prime Minister's Department 2021). Viet Nam's **National Digital Transformation Program** to 2025 likewise establishes a series of concrete targets, such as achieving 80 percent household fibre-broadband coverage and having half of the population use e-payments channels, among other targets (Phuong 2020).

Complementing these infrastructures are the targeted capacity-building programs that aim to equip citizens, especially in rural and underserved areas, with the digital skills necessary to participate in the emerging digital economy. Brunei runs a Digital Skills Upskilling Scheme and holds yearly Tech Bootcamps that train and certify at least 5,000 people each year in fields like data analytics, artificial intelligence, and network security. In Cambodia, the Ministry of Education partnered with Meta and KAPE to roll out the Khmer Digital Literacy Programme. It adapts Meta's WeThinkDigital curriculum for New Generation Schools, helping thousands of students and teachers build basic ICT skills (Kiripost 2023). Similarly, Cambodia's Ministry of Posts and Telecommunications worked with UNESCO to launch the Digital, Media and Information Literacy (DMIL) Competency Framework.

Governments in the ASEAN region have begun investing heavily in ICT infrastructure projects as well:

> Indonesia's **Palapa Ring Project** deployed over 12,000 km of undersea and terrestrial fibre-optic cables to interconnect 514 districts across the country, delivering gigabit-capable fixed broadband to previously unserved outer regions (O'Connor, Anderson, Brower, and Lawrence 2020). In June 2023, the Indonesian Ministry of Communication and Digital Affairs (Kominfo) launched the SATRIA-1 satellite through public-private partnership (PPP) to extend broadband connection to more than 150,000 public sites across the islands, including schools, clinics, and hospitals (The Jakarta Post/Asia News Network 2022).

> In the Philippines, the **National Broadband Plan** prompted the government to build a national fiber backbone, while deploying public Wi-Fi hotspots in urban and rural barangays to effectively raise the baseline connectivity in the country.

This guide outlines eight key digital skills; from understanding data to staying safe online, and is now used in schools nationwide (UNESCO 2023). In the Philippines, more than 2,200 Tech4ED centers have been set up across the country since 2018. These centers offer free workshops on digital skills, access to online learning, health services, and government transactions. Singapore's Digital for Life Movement supports digital inclusion for seniors through programs like Seniors Go Digital and Mobile Access for Seniors. Each year, over 9,000 older adults across Singapore receive training, and many low-income seniors also get subsidized devices and mobile plans (Sagar 2020).

Several ASEAN countries have also launched large-scale scholarships and fellowship programs as part of recognizing the need to build a strong pipeline of digital experts. In Indonesia, the Kominfo runs the Digital Talent Scholarship, which has already helped train over 100,000 people in fields like data science, cloud computing, and cybersecurity (ETHRWorld Southeast Asia 2025). The program offers free online courses and job placement support to boost digital employment. In Viet Nam, the Viettel Digital Talent Program provides yearly fellowships for students and professionals specializing in artificial intelligence (AI), cloud computing, and the Internet of Things (IoT). The goal of the program is to grow a pool of skilled ICT experts for the country's fast-growing tech industry (Hanoi University of Science and Technology 2025). All of these programs ensure that graduates are ready to meet real-world demands in the ICT sector.

2.3 Synthesis

The comprehensive analysis of gender and ICT datasets alongside policy indicators reveals a complex landscape of both progress and persistent challenges across ASEAN member states. While the region has taken important steps in setting up policy frameworks and initiatives for advancing women participation in ICT, data show that converting these commitments into concrete outcomes remains a struggle across countries and indicators.

The data gathered paint a more nuanced portrait of digital participation of ASEAN women. Even as internet access gaps are narrowing in some countries like Indonesia (8.88% in 2015 to 4.2% in 2023) and near parity in Singapore, they are widening in others like Timor-Leste (21%) and Cambodia (12.5%). These differences in basic digital access affect all aspects of the ICT ecosystem. Countries with large internet access gaps always have low female participation rates on all other indicators, from device ownership to workforce participation. The Philippines is an exception with a reverse gender gap on internet access at -2.12% and mobile ownership at 81% women versus 77% men, indicating that contextual factors beyond infrastructure play crucial roles in shaping digital inclusion outcomes.

The educational pipeline data shows that although basic education continues to perform well, the sharp drop in female ICT course enrolling, as in Singapore where enrollment dropped to 27.63% by 2023, illustrates that systemic barriers become more severe as women move up the educational ladder. This educational attrition correlates with workforce underrepresentation: women account for only 28% of ICT workers in Indonesia and rarely over 40% across most member states. Discrepancies between high female completion rates when enrolled and low enrollment numbers suggest that the challenge is not in the women's capabilities but barriers to entry and retention.

On the policy front, ASEAN has built a strong architecture for gender mainstreaming ICT sector. All member states except Brunei Darussalam have ratified CEDAW and developed National Gender equality frameworks. The adoption of the ASEAN Digital Masterplan 2025 and the Gender Mainstreaming Strategic Framework demonstrates regional commitment to addressing these gaps. Innovative approaches like the Philippines' mandated 5% GAD budget allocation and Singapore's SG Women in Tech program showcase how policy innovation can create systematic change. Proliferation of education initiatives, ranging from scholarship programs to coding bootcamps geared toward girls and women show growing awareness of the need for targeted interventions.

However, a critical implementation gap emerges when comparing policy ambitions with actual outcomes. **Despite comprehensive legal frameworks and strategic plans, the data shows that progress remains incremental and uneven as evidenced by countries with most elaborate policy frameworks that do not necessarily demonstrate the best outcomes.** This indicates that policy design alone is not sufficient without effective implementation mechanisms, adequate resource allocation and sustained political will. The inconsistency in data collection itself, with many countries lacking recent or comprehensive gender-disaggregated ICT statistics, hampers evidence-based policymaking and accountability.

The entrepreneurship ecosystem has opportunities and challenges. Whilst initiatives like **Go Digital ASEAN** (see Page 50) and other national programmes have trained hundreds of thousands of people explicitly on gender inclusion issues, female business owners are still marginalised across the region, typically just 20-30% of total business ownership. The gap between digital skills training participation and actual entrepreneurship outcomes indicates that other barriers such as access to finance, market linkages and supportive business environments need targeted attention.

Three critical insights emerge from this analysis:

#1 The digital gender divide isn't just about access but about a web of interconnected educational, cultural, institutional and economic factors.

#2 Although policy frameworks have evolved, implementation is fragmented, under-resourced and poorly monitored.

#3 The differences among ASEAN member states such as the reverse gender gap in the Philippines and persistent divide in Indonesia show that one size fits all approaches are inadequate; solutions should be nationalised and localised while ensuring regional coordination.

To address these gaps, we need to move beyond policy formulation towards implementation excellence, from pilot projects to scaled solutions, and from isolated initiatives to integrated approaches addressing the lifecycle of ICT participation for women, from early education to career advancement and entrepreneurship. The data indicates that without such broad action, the region risks sustaining and potentially expanding the digital gender divide, which would undermine its economic competitiveness and social equity goals. The following section examines in detail the specific challenges and barriers that perpetuate these gaps, providing deeper insight into why progress remains limited despite significant policy efforts.

Current Situation

Women in ICT Across ASEAN Member States

30-40%

Average Female ICT Representation

42%

Highest (Thailand 2020)

22%

Lowest (Indonesia 2020)

\$1T

ASEAN Digital Economy Target 2030

Internet Access Gender Gaps

Singapore

0.34%

Gender Gap 2021

Near Parity

Achievement

Reduced from 6.11% (2009) to 0.34% (2021)

Indonesia

4.2%

Current Gap 2023

8.18%

Gap in 2015

Steady improvement but millions still excluded

Philippines

-2.12%

Reverse Gap 2022

Women

Lead Access

Reduced from 6.11% (2009) to 0.34% (2021)

Cambodia

12.5%

Gender Gap 2022

High

Priority Level

Among highest gaps in region

Timor-Leste

5-21%

Gap Range 2023

Unstable

Trend Pattern

Severe and fluctuating inequalities

Malaysia

2-4%

Typical Gap

6.38%

Peak in 2021

Generally low but with fluctuations

ICT Workforce Representation

Female Participation Rates

2023

68.6%

Singapore

2023

67.9%

Malaysia

2022

39%

Brunei

2020

35.3%

Thailand

2019

32%

Philippines

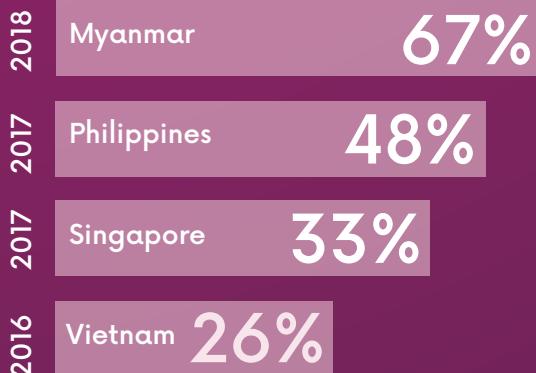
2020

28%

Indonesia

Educational Attainment Trends

ICT Graduates



Educational Pipeline Concerns

Singapore Decline: Female ICT enrollment dropped from 45% (1991) to 28% (2023)

STEM Patterns:
Women overrepresented in humanities (60-80%) but underrepresented in technical fields

Completion vs Enrollment:
Women often outperform in completion but face barriers to entry

Policy Integration Landscape

Philippines GAD Framework: Mandatory 5% budget allocation for gender programs including ICT initiatives

Thailand

PISA Performance: Girls outperforming boys in STEM assessments but gaps persist in ICT careers

Singapore SG Women in Tech: Public-private partnership launched in 2019 to develop female tech talent

Regional Level

ASEAN Digital Masterplan 2025: DO8 promotes digitally inclusive society across member states

3

Challenges and Barriers



Despite policy gains, women across ASEAN still face numerous barriers to full participation in the ICT sector. These barriers are multidimensional and deeply rooted in systemic and institutional structures. In this section, we distinguish these barriers either as systemic, socio-cultural, or economic and institutional. Underlying these categories are the pervasive gender norms and biases in each country. Previous studies have noted that women benefit less than men at each stage of the digital ecosystem, resulting in a “gender digital inequality” that reinforces the overall gender equality (Sey and Hafkin 2019). In other words, barriers exist at every level of cyberspace, from girls getting online in the first place, to female tech professionals breaking the “glass ceiling.” It is crucial to understand these barriers in context, because they are often interlocking in nature. For example, a lack of women in the tech workforce (an institutional issue) can be traced back to biases in education and hiring (systemic issues), and both are exacerbated by a lack of supportive policies to drive change.

Sefrina (2023: 37) highlights four key dimensions of the digital gender divide that need to be addressed. These are: (i) the gap in access to and use of the internet; (ii) the gap in digital skills and use of digital tools; (iii) the gap in participation in STEM education; and (iv) the gap in leadership and entrepreneurship in the tech sector. These categories provide a useful framework for identifying where barriers occur. Systemic barriers largely cover the first three categories (access, skills, and education), all of which are foundational for women to enter into the digital arena and participate meaningfully. Economic and institutional barriers relate closely to the fourth category (leadership and entrepreneurship) and to women’s status in the digital labor force and policy environment. Moreover, a consistent challenge cutting across all levels is data gaps in the ICT sector. Without the presence of sex- and gender-disaggregated data, many of these issues will remain “invisible” and left unaddressed. In the context of ASEAN, the continued paucity of gender-specific ICT data has been noted as a hindrance to tracking progress (Gerard and McDonnell 2024).

4 key dimensions of the digital gender divide



**Gap in
access to
and use of
the internet**



**Gap in
participation
in STEM
education**



**Gap in
digital skills
and use of
digital tools**



**Gap in
leadership and
entrepreneurship
in the tech
sector**

3.1. Barriers

3.1.1. Systemic Barriers

Digital divide and infrastructure gaps

One of the fundamental barriers to bridging the gendered digital divide around the world is limited access to affordable digital devices for women and girls. This includes their inability to purchase smartphones, laptops, or tablets due to financial constraints, as well as restricted access to shared or community-owned technology (Marston et al. 2022). In many low-income settings, digital devices are often prioritized for male family members (Zainudeen and Galpaya 2015: 33). Internet access is another significant component of this divide. Women and girls, particularly in rural or marginalized communities, frequently face challenges in securing consistent, high-speed internet connections. These challenges stem from infrastructural gaps, high data costs, and safety concerns related to online spaces. In some regions, cultural norms and gender-based restrictions further limit their ability to access the internet freely and safely. According to the ITU (n.d.), a substantial portion of the world's unconnected population, which is estimated at 2.6 billion, are women and girls. In 2022, only 57% of women globally were using the Internet, compared to 62% of their men counterparts.

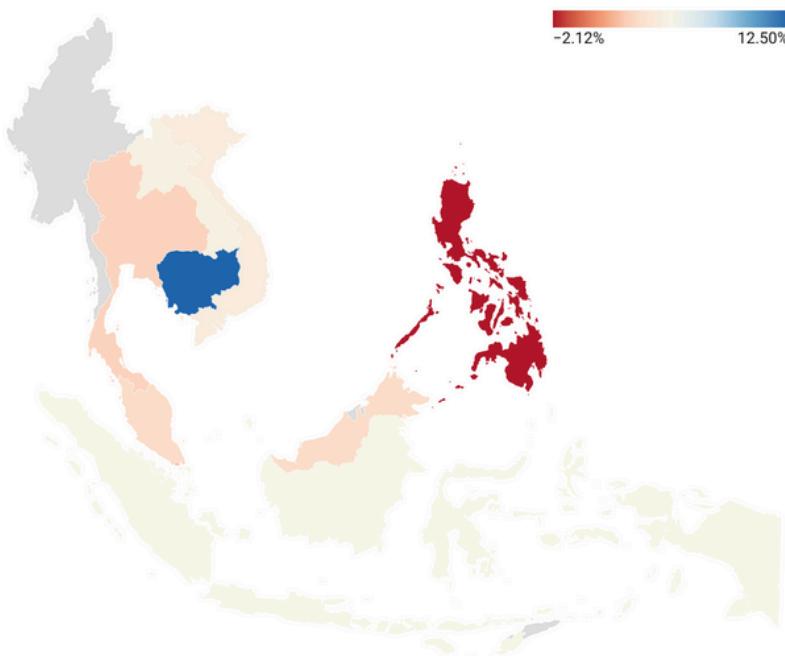


Figure 10. Gender Gap in Internet Access in ASEAN, 2022

Source: Authors' construction based on compiled regional data.

Notes: The values for Viet Nam and Lao PDR reflect 2023 data due to unavailability of 2022 figures. The lighter the color, the smaller the gender gap, indicating more equal internet access between men and women. Darker shades represent wider gender gaps, where women have less access than men.

The same is true for ASEAN, as development has been uneven across countries and population groups, with gender emerging as a key determinant of digital exclusion. Citing Jalli (2024), Adriana (2024) noted that internet penetration rates in most ASEAN countries exceed 70%, with over 400 million internet users across the region. However, women, especially those in rural areas with low literacy and income levels, remain less likely than men to access and use digital technologies. Figure 10 above shows the gender gap in internet access across the region over the past decade, highlighting the persistent disparities despite increasing overall connectivity in the region. Countries such as Timor Leste, Papua New Guinea, and Cambodia show some of the highest gender gaps in the region, indicating that women are significantly less likely than men to access the internet. While digital inclusion has improved in several middle-income countries like Malaysia and Thailand, women's access still trails men's by several percentage points. In contrast, the Philippines recorded a negative gender gap in 2022, suggesting that more women than men had internet access in that year.

In terms of mobile ownership, disparities between men and women remain evident across several ASEAN member states, although the gap has narrowed in recent years. In Timor Leste, for example, data from 2015 shows that 77.3% of men owned a mobile phone compared to 65.6% of women. In contrast, more recent figures from Thailand show significantly higher mobile ownership rates overall, with 88.8% of women and 89.2% of men reporting ownership in 2024. Meanwhile, Singapore demonstrates near-universal mobile phone ownership, with 2023 data indicating 98.6% of men and 97.8% of women owning a phone. In the Philippines, the trend appears to reverse, as 81% of women owned a phone compared to 77% of men, suggesting a positive shift toward gender inclusion in mobile access (see Figure 11).

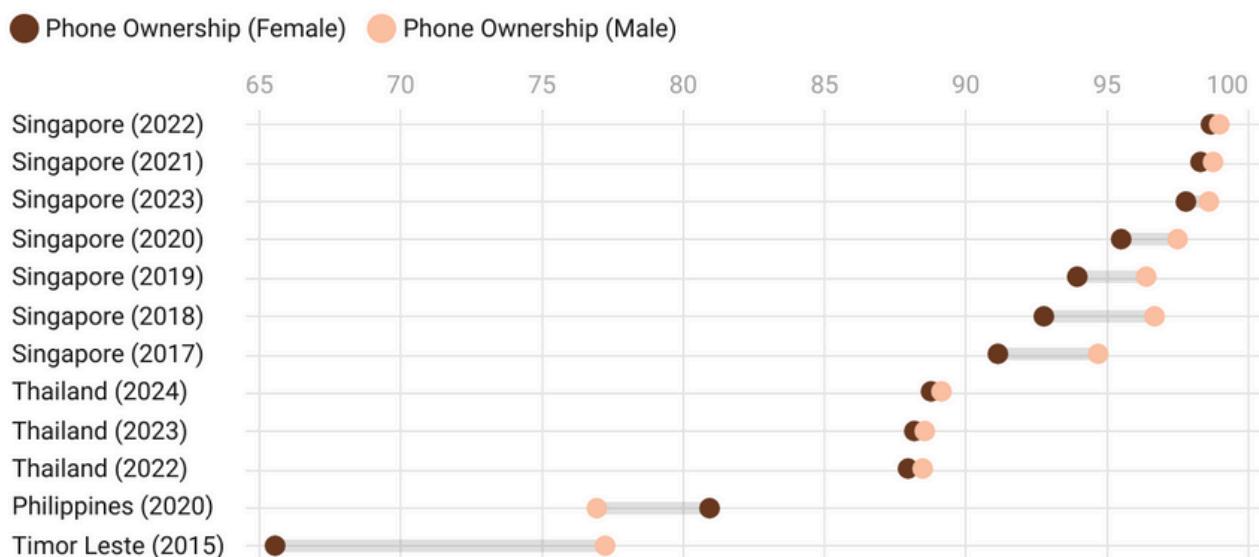


Figure 11. Mobile Phone Ownership by Gender in Selected ASEAN Countries, 2015-2024.

Source: Authors' construction based on national digital inclusion datasets and ITU statistics.

Note: Values reflect the percentage of individuals aged 15 and above who reported owning a mobile phone.

Addressing these issues requires the adoption of gender-responsive infrastructure policies, such as expanding rural broadband, as pledged in the ADM 2025, and subsidizing devices or data for women in need. Some ASEAN governments are trying to bridge infrastructure gaps for women. For example, in Malaysia, the Malaysian Communications and Multimedia Commission (MCMC) has launched the Jalinan Digital Negara (JENDELA), as part of the 12th Malaysia Plan (2021-2025). JENDELA aims to enhance digital connectivity by improving broadband quality and expanding coverage in underserved and rural areas. While the initiative does not explicitly target women, its focus on rural connectivity indirectly benefits women in remote communities, who are often disproportionately excluded from digital access due to geographic and socioeconomic barriers (Nohuddin et al. 2025).

An in-depth discussion of these ASEAN-specific initiatives and successful approaches will follow in the next section.

Educational system limitations

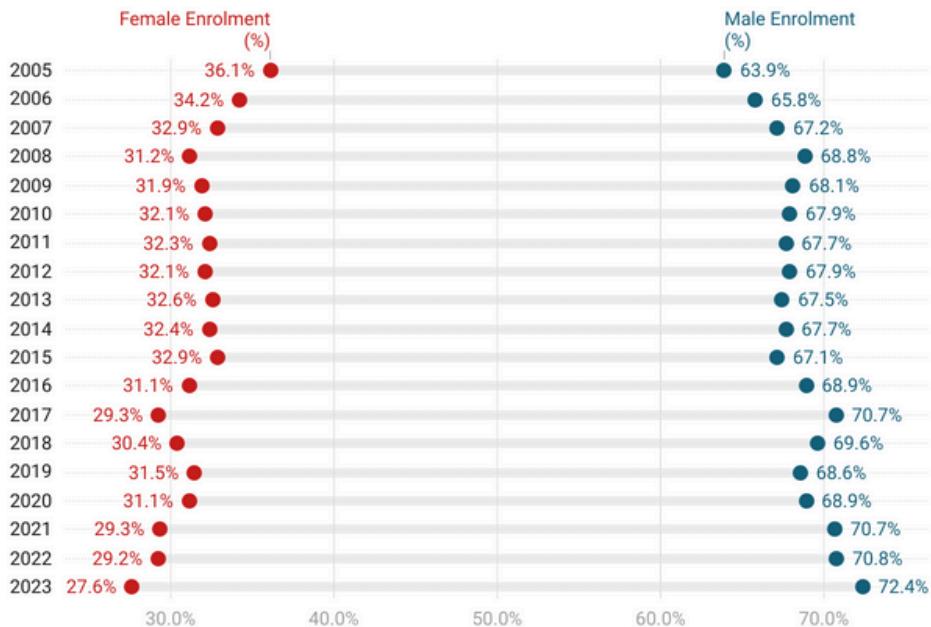


Figure 12. ICT Course Enrollment Rates in Singapore by Gender, 2005-2023

Source: Author's construction based on Singapore Ministry of Education (MoE) datasets.

Education plays a major role in shaping women's future in the ICT sector, but gender gaps remain throughout the system. While most ASEAN countries were able to achieve high enrollment rates for girls in basic education, fewer girls continue into science, technology, engineering, and mathematics (STEM) as they move through higher levels of education. One key reason behind the trend is the persistence of gender stereotypes in higher education institutions and communities. In many ASEAN countries, traditional beliefs still influence which careers are seen as "suitable" for girls (Joseph and Matthews 2014). Science and technology have long been viewed as "male" fields, which discourages girls from exploring them (Hill, Corbett, and St Rose 2010). A 2022 UNICEF study found that young people commonly thought women were better suited for jobs like teaching or cooking, and that girls in tech might face stigma especially in countries like Indonesia, Thailand, and Lao PDR.

As a result, many girls begin to doubt their own abilities, even when they perform just as well, or better, than boys in science and math. This has serious consequences. By secondary and tertiary education, women make up a smaller share of students in ICT programs. In Malaysia, for example, only around 40% of ICT students at the secondary level are female, and just 33.9% are in engineering courses. In Cambodia, less than 10% of ICT tertiary graduates are women (Sefrina 2023). Figure 12 above displays a snapshot of gender disparities in ICT education pathways in ASEAN, with available data currently limited to Singapore.

As shown in Figure 12, male enrollment in ICT courses in Singapore has steadily increased over the last 18 years, from 63.9% in 2005 to 72.4% in 2023. Female enrollment, on the other hand, has declined over the same period, dropping from 36.1% to just 27.6%. This persistent and widening gender gap suggests that systemic barriers continue to discourage or limit women's participation in ICT education. Interestingly, despite consistently lower enrollment rates, female students in Singapore often outperform their male counterparts in terms of ICT course completion, as shown in Figure 11. From 2005 to 2023, there are several years, such as 2014 (+5.12%), 2016 (+6.46%), 2018 (+8.66%), and 2021 (+6.06%), when female completion rates exceeded those of males. Even in years when female completion was lower, the gap was often relatively small, especially compared to the much wider enrollment gap.

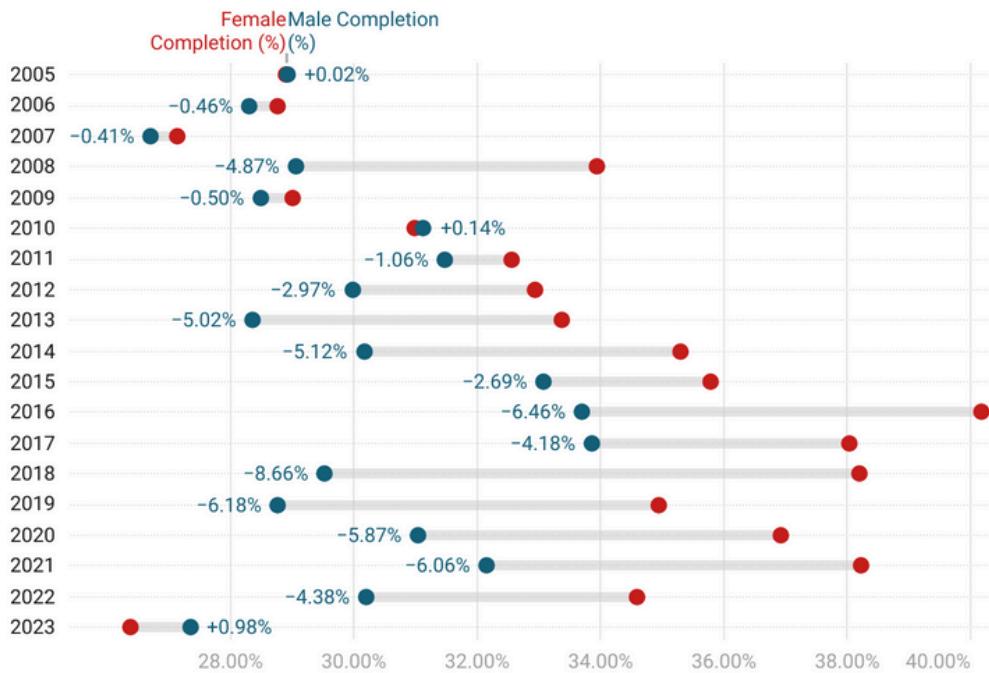


Figure 13. Gender Gap in ICT Course Completion Rates in Singapore, 2005–2023.

Source: Author's construction based on Singapore Ministry of Education (MoE) datasets.

This trend suggests that while fewer women enter ICT pathways, those who do are just as capable, if not more likely to complete, than their male peers. The issue, therefore, is not only of one's ability, but also of access, opportunity, and sustained support. To do this however, it would require a proactive and system-wide approach that addresses both the structural and cultural barriers deterring girls and young women from entering and remaining in ICT fields. This includes revising gender-biased curricula, training educators to provide inclusive guidance, and investing in early exposure programs that make ICT relevant and accessible to girls from an early age. Moreover, policies must ensure that girls, especially those in rural areas and ethnic minority groups, are not left behind in digital transitions.

Data gaps and monitoring challenges

An often overlooked systemic barrier in the development of gender-equitable digital policies is the lack of robust gender-disaggregated data and monitoring mechanisms in the ICT sector. Previous studies have argued that the process of data collection in many ASEAN member states remains fragmented, inconsistent, and often gender-blind, making it difficult to track the full extent of digital inequalities across different socio-economic and geographic contexts. In some cases, ICT indicators are either not sex-disaggregated or fail to capture intersectional dimensions such as age, income level, disability, or rural-urban divides. Some of the reasons behind this include the limited institutional capacity of national statistics offices, the lack of standardized data collection frameworks, and insufficient prioritization of gender in digital policy planning. Sey (2023: 11–13), for instance, observed that the availability and regular collection of gender-disaggregated digital access indicators across ASEAN member states vary widely. Thailand leads the region in both the number of indicators tracked and the frequency of data collection, with countries like Singapore, Indonesia, and Malaysia following at a considerable distance. In contrast, most other AMS collect fewer than half of the recommended indicators, and what exists is often outdated or inconsistent. Notably, countries such as Lao PDR and the Philippines were identified as having the least comprehensive sex-disaggregated datasets, limiting their ability to design and monitor targeted digital inclusion strategies (see Table 3).

Country	Number of Indicators	Number with Recent Data	Number with Time Series
Thailand	14	10	13
Singapore	9	3	5
Indonesia	8	8	8
Malaysia	7	7	7
Cambodia	6	1	4
Brunei	5	0	2
Viet Nam	4	4	3
Myanmar	3	1	1
Lao PDR	1	1	1
Philippines	1	1	1

<< **Table 3.** Availability of Sex-Disaggregated Data on Digital Access and Use in ASEAN

Addressing this challenge requires strengthening national statistical systems and making sure that a sustained commitment is in place to routinely track gender-disaggregated indicators in ICT. Some progress has been made through partnerships with international organizations. For instance, UN Women (2024) have supported the ASEAN region in developing gender-sensitive ICT indicators in recent years. The ASEAN Secretariat itself has also begun to include sex-disaggregated ICT data in selected regional reports. However, data availability remains limited. As a result, advocacy for women's digital inclusion often relies on fragmented evidence, and the effectiveness of programs and policies may go unmeasured or undocumented.

3.1.2. Social and Cultural Barriers

Gender stereotypes and biases

Gender stereotypes continue to shape the landscape of ICT participation in ASEAN by reinforcing the perception of science and technology as a male-oriented domain. These stereotypes are introduced early in life and persist throughout education and into the workplace. A number of regional studies consistently show that computing and engineering are associated with traits culturally coded as masculine, such as logic, technical skill, and competitiveness, which contributes to the marginalization of women in these fields (Vitores and Gil-Juárez 2016). These traits are not inherently gendered per se, yet the cultural framing around them leads to the exclusion of women from spaces that are considered "technically rigorous" for their perceived lack of fit. This process often begins in childhood, where boys are more frequently encouraged to explore digital tools and receive tech-related toys. Girls, on the other hand, are steered toward activities that emphasize care, communication, or aesthetics (Wang and Degol 2017). These early patterns of reinforcement affect not just skill development but also identity formation, shaping who sees themselves as capable of working in technology-related roles.

In the ASEAN context, these global patterns intersect with local gender norms to create an environment where girls and women are discouraged from pursuing ICT pathways. A recent UNESCO (2020) study examining STEM stereotypes in Southeast Asia found that parents and teachers across the region were more likely to describe boys as naturally inclined toward technological and scientific subjects. This bias, even when unintentional, influences how young people are supported in their learning environments. The result is a kind of educational gatekeeping that undermines girls' confidence in their abilities. In Thailand, Jarunratanakul, P., & Jinchang, K. (2018) and Jitkaew, N. (2019) found that female university students in STEM and ICT programs reported experiencing "stereotype threat," or the anxiety coming from their fear of confirming negative gender-based assumptions, which had measurable impacts on their overall academic and career performance and persistence.

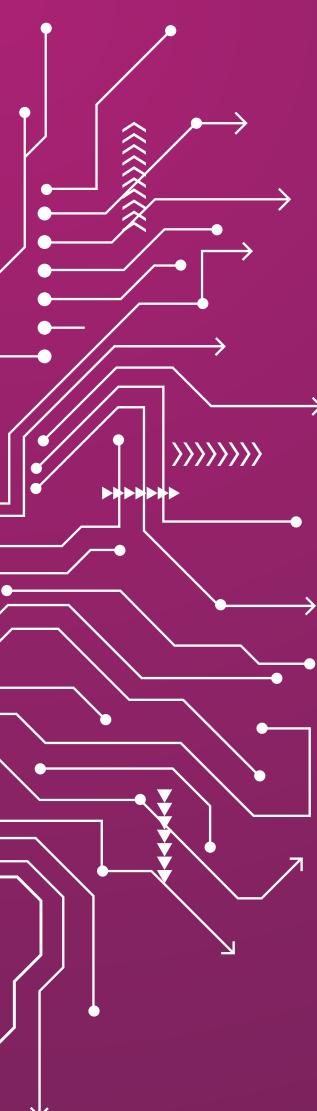
Propagating these stereotypes through media representation also reinforces the association of technology with masculinity. Representations in television, advertising, and online content continue to depict men as inventors, coders, or technical experts, while women are either absent or framed as passive consumers of technology. In content analysis of media representations, women are consistently underrepresented as technical workers in ASEAN technology media and instead, men are portrayed as creators and experts, while women appear mostly as passive users, reinforcing stereotypes that link technology with masculinity (Public Media Alliance, 2023). In Indonesian media, for example, women are broadly underrepresented and often portrayed in stereotypical or supporting roles, reflecting patriarchal cultural norms (Murtiningsih and Advenita, 2017). This symbolic annihilation of women in technology narratives prevents girls from imagining themselves in ICT careers and reinforces societal expectations of what is gendered work.

Family and community expectations

The combination of family expectations together with community expectations also forms a substantial challenge that prevents women from participating in ICT activities across ASEAN where collectivist cultural values often prioritize family harmony and adherence to traditional gender roles over individual career aspirations. In many Southeast Asian societies, women face intense pressure to balance professional ambitions with expectations to be primary caregivers and maintainers of family relationships (Yukongdi and Benson, 2005). Women working in technology face an extreme "double burden" as they must reconcile their work requirements with traditional family duties that demand their constant presence.

A research study conducted by Milieu Insight (2024) revealed that **60% of working mothers in Southeast Asia, including those in the IT sector across countries like Singapore, Indonesia, and Thailand, struggle to balance work and family commitments, with many facing societal pressure to prioritize family responsibilities over career advancement.** According to Vo (2014) female ICT professionals in Vietnam often experience pressure from cultural expectations to reduce work intensity after marriage, limiting their career progression. The expectation that women will eventually leave the workforce or reduce their commitment makes employers less likely to invest in their technical training or consider them for challenging projects, creating a cycle of limited opportunities.

The attitude of communities toward women's mobility and independence creates obstacles that prevent them from pursuing ICT careers. Women in traditional regions face societal expectations that restrict travel for work or training, especially when it involves overnight stays or interactions with male colleagues. A 2021 study by Tanti et al. found that women-led micro, small, and medium enterprises (MSMEs) in Malaysia and Indonesia encounter sociocultural constraints, including limited mobility due to family responsibilities, which hinder participation in ICT-related activities. The technology sector's culture of networking events, hackathons, and conferences, often held outside regular working hours or requiring travel, becomes inaccessible to women facing such restrictions. A 2022 study by Susantia et al. noted that Indonesian women MSMEs face family expectations that limit after-hours professional engagement, impacting ICT career growth. These cultural and structural constraints reduce women's access to critical professional opportunities in the ICT sector.



Moreover, the concept of "appropriate" work for women remains strongly influenced by community perceptions of respectability and safety. Women face opposition to working in ICT positions especially when these roles exist within startups or predominantly male work environments because of workplace culture and extended working hours concerns. Rural parents in the Philippines and Cambodia choose teaching and healthcare jobs for their daughters instead of technology careers because they view these fields as "safer" careers despite ICT offering superior economic prospects (Francisco and Canare, 2019). A 2023 ADB report notes similar biases in Cambodia, limiting women's STEM participation. These community-level biases are also reinforced through informal social networks, where social sanctions and scrutinyas noted by Ho et al. (2024) discourage families from supporting women's technology career aspirations.

Role model deficiency

The limited visibility of female leaders in technology continues to be a structural barrier that affects both the attraction and retention of women in ICT careers across the ASEAN region. Leadership presence shapes organizational culture and influences career expectations; without visible female figures in senior positions, women entering the field often lack concrete examples of long-term professional success. According to Gibson (2004), role models support career development by functioning as proof of possibility, offering navigation strategies for overcoming challenges, and providing direct mentorship to individuals at earlier stages of their career. The scarcity of such role models in the region reinforces the perception that leadership in ICT and related fields is a male domain. Women's World Banking (2016) highlights that women remain underrepresented in senior tech roles across Southeast Asia, with many leaving the sector due to family responsibilities. This lack of representation contributes to a persistent "visibility gap," reinforcing a cycle of exclusion in which the absence of women in leadership roles discourages others from entering or progressing within the field.

The educational sector reflects a similar pattern as well. Although colleges and universities play a critical role in shaping early professional identities, women remain underrepresented among ICT faculty. UNESCO (2023) reports that women comprise less than 30% of STEM faculty globally, with similar trends in ASEAN's computer science departments, where female representation is approximately 20–25%. In Singapore, female ICT students often lack female professors, reducing access to mentors who understand gender-specific challenges, as noted by Ho et al. (2024). With this, many students have difficulty finding academic mentors who could relate to or understand gender-specific challenges. The low number of female faculty contributes not only to a lack of support networks but also to the broader cultural message that technical expertise is male territory.

The absence of women in leadership has ripple effects that extend beyond representation in the ICT sector. For one, it actively shapes workplace norms, values, and expectations in ways that marginalize women's experiences. Without female leaders to influence organizational culture, many ICT companies in the region default to environments where communication styles, networking events, and informal mentorship systems reflect male-dominated norms. Research by Trauth et al. (2016) describes how these cultures often prioritize traits such as assertiveness and competitiveness, while overlooking work-life integration and collaborative leadership; areas that are often identified as more important to female professionals, marginalizing women's experiences. Ho et al. (2024) confirm that Southeast Asian tech firms often lack family-friendly policies, impacting women's retention and promotion.

The intersection of role model deficiency with media representation also creates powerful barriers for girls and young women who are considering technology careers. Media representations of successful women in technology typically portray them as "exceptional cases" who overcame gender obstacles to succeed while reinforcing the idea that technology belongs to men rather than showcasing women as typical technology professionals (Cheryan et al. 2013). In Malaysia, media often emphasize women's family roles over technical achievements, limiting their influence as role models (Tanti et al., 2021).

Furthermore, the few visible women in technology often face what scholars called the "token tax," or the disproportionate demands to serve as mentors, sit on diversity panels, and represent their gender in addition to their regular work responsibilities (Casad et al. 2021). While visibility is important, this kind of overextension in the workplace can result in burnout and unintended professional stagnation (i.e., slower career advancement, reduced opportunities). A 2023 McKinsey study found that women in tech leadership globally face high burnout rates, with similar trends in ASEAN, where tokenism pressures women to consider leaving senior roles. This creates a paradox where the absence of female role models increases the demand for visible representation, yet the resulting pressure placed on those few in leadership makes it difficult for them to maintain their roles over time.

3.1.3. Economic and Institutional Barriers

Workforce underrepresentation patterns

Even when women overcome systemic barriers to enter the ICT field, they often encounter workplace and industry barriers that may impede their career progression. A central issue is the underrepresentation of women in the ICT workforce, especially in higher-paying technical and leadership positions. As mentioned in the previous section, in most ASEAN countries, the tech and innovation industry remains a male-majority domain. A 2022 report from ASEAN found that countries like Brunei and Cambodia have extremely skewed ratios between men and women in ICT roles. The same report also shows that while countries such as the Philippines have more women in certain ICT sectors, such as IT-enabled services and business process outsourcing (BPO), generally speaking, women are still underrepresented in core areas like software development, network engineering, data science, and IT management across the region. Figure 14 shows the proportion of women in the ICT workforce (a), women in ICT management positions (b), and women in ICT leadership roles (c) across selected ASEAN countries.

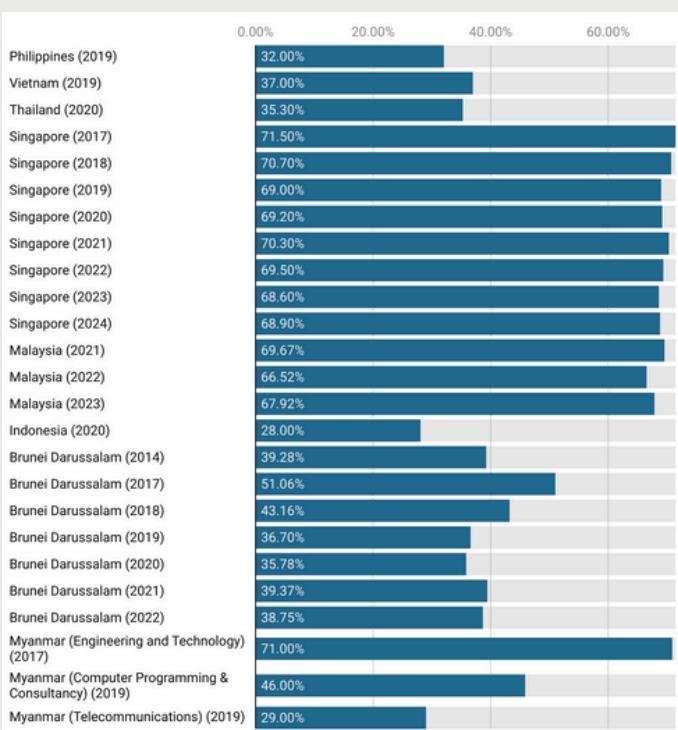


Figure 14a. Percentage of Women in the ICT Workforce in Selected ASEAN Countries, 2014-2024

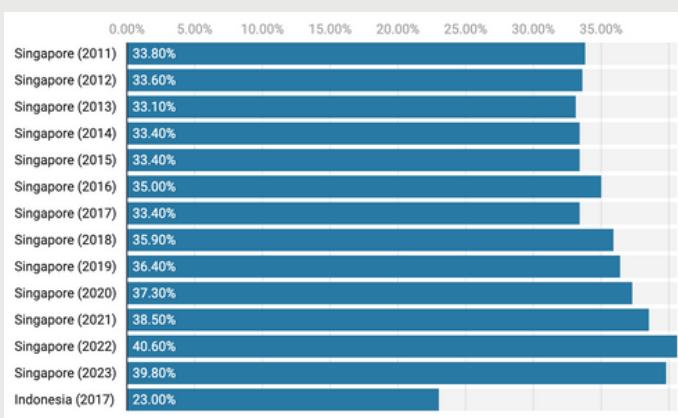


Figure 14b. Percentage of Women in ICT Management Positions in Selected ASEAN Countries, 2011-2023

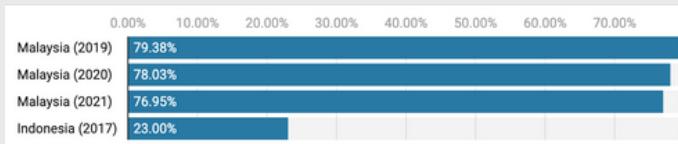


Figure 14c. Percentage of Women in ICT Management Positions in Selected ASEAN Countries, 2011-2023

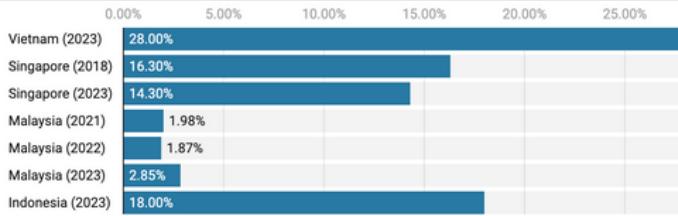


Figure 15. Gender Pay Gap in the ICT Sector in Selected ASEAN Countries, 2018-2023

This workforce gap is both a symptom and a cause of other barriers. For one, being a minority in the workplace can create an unwelcoming environment (Kaur et al. 2023). Women in tech jobs frequently report feelings of isolation, lack of mentors, and even explicit or implicit biases from colleagues (Ashcraft, McLain, and Eger 2016). The tech “bro culture” which can be characterized by unconscious bias in hiring and promotion, networks that exclude women, and sometimes overt sexism, is a significant institutional barrier (Kreiss et al. 2020). Anecdotal evidence in ASEAN mirrors global trends that women in tech have to prove themselves more, may be passed over for challenging projects, or get channeled into “softer” roles (like project management or testing) rather than hardcore technical roles that lead to the top (Rana 2010). Moreover, work-life balance pressures disproportionately push women out of the sector. The combination of long or irregular hours in tech startups and persistent social expectations that women shoulder childcare and home duties means many women opt out in their careers, especially when employers lack flexible policies (Holtzblatt and Marsden 2022).

Another manifestation of workplace underrepresentation of women in ICT is the persistent gender pay gap. Women in tech roles across ASEAN, as in many parts of the world, tend to earn less than their male counterparts, even when they hold similar qualifications and perform comparable work (Wignall et al. 2024). This pay disparity is often compounded by the segregation of roles within the ICT sector, as women are more likely to be found in administrative positions, which are typically lower paid, while men dominate higher-paying technical and executive roles (Yeganehfari, Isfandyari-Moghadam, and Famil-Rouhani 2018; Segovia-Pérez et al. 2020).

The lack of transparency in salary structures and underrepresentation of women in decision-making positions often leave women with less bargaining power when negotiating pay (van Engen and Kroon 2024). A 2021 ASEAN report projects the gender wage gap in the region will remain around 20% by 2025, with increases anticipated in Indonesia, Viet Nam, and Lao PDR. This inequality reflects and reinforces structural disadvantages, discouraging women from entering or remaining in the field.

Closing the gender pay gap requires deliberate policy interventions. These include enforcing equal pay legislation, promoting salary transparency, conducting gender audits, and fostering inclusive corporate cultures. Equally important to these is supporting women in ascending to higher-paying, high-impact roles through a combination of mentorship and leadership training. Without addressing the pay gap, efforts to increase women's participation in ICT will fall short of achieving gender equality in the digital economy.

Policy implementation gaps

As described in the previous section earlier, most ASEAN countries now often have gender equality goals in their ICT and digital economy strategies. However, a major challenge lies in translating these policy commitments into effective action on the ground. There is frequently a gap between what policies or plans state and what is actually implemented on the ground.

Several issues contribute to this implementation gap. First, some national policies on women in ICT remain broad or aspirational without concrete targets or budgets. For example, an approved strategy might declare support for women in tech but lack a detailed plan or funding for specific programs, leading to limited impact. In other cases, good programs are piloted but not scaled due to resource constraints or political changes. Another problem is insufficient coordination among national and local government agencies. Promoting women in ICT cuts across different ministries, but governments may lack an effective cross-agency mechanism to drive these initiatives. This can result in fragmented efforts. Moreover, without strong monitoring and evaluation mechanisms (as noted in systemic barriers), there is a high possibility of little to no accountability from the public sector.

Institutional gender mainstreaming capacity is also an issue, as not all ICT ministries or agencies have the required gender expertise to design and execute gender-responsive programs. Many depend on women's ministries or external consultants, and if that support is absent, the gender components of digital projects might be the first to be dropped when budgets tighten or when other priorities compete (e.g., focusing on infrastructure over inclusion). For instance, while ASEAN's Digital Masterplan and many national plans highlight gender inclusion, the rollout often prioritizes hard infrastructure and business needs, and gender considerations risk becoming perfunctory checkboxes. An example can be seen in Indonesia, where Sefrina (2023: 40) observed that women's issues in the digital economy were acknowledged in paper, but the solutions offered tended to be generic (e.g., "train women in digital skills") without addressing deeper causes, partly because policymakers had not defined the problem in full detail. This has led to well-intentioned initiatives that did not fully reach those most in need.

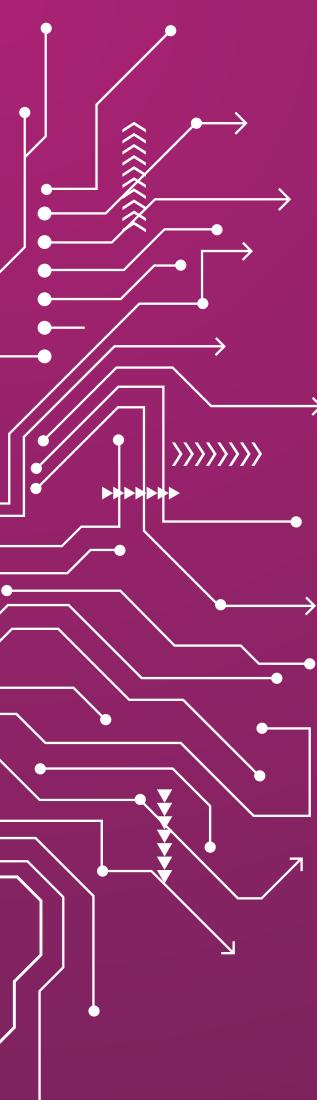
Furthermore, some existing regulations unintentionally hinder women, as policy-related barriers can lurk in areas that are seemingly unrelated to gender. A striking example is the credit and collateral policies in certain countries. Until recently in Indonesia, loan regulations required a male family member co-signer if a woman entrepreneur lacked sufficient collateral, since women on average owned fewer titled assets. This effectively locked many capable women out of business financing, which is a clear gap between the goal of supporting women entrepreneurs and the reality of financial rules. The Indonesian government, through the Coordinating Ministry for Economic Affairs, recognized this issue and introduced new alternative collateral options under programs like Kredit Usaha Rakyat (KUR) (*ibid.* 2023). But it highlights how policy details matter in the inclusivity agenda. Without the presence of a gender lens throughout the policy-making process, well-meaning economic policies can inadvertently sideline women.

In summary, the implementation gap means that even where high-level support exists, the institutional mechanisms, funding, and political will to carry out changes may lag over time. Bridging this gap will require strengthening gender institutional frameworks; for example, making sure that each ICT and digital initiative has gender indicators and dedicated budget (a practice that the Philippines uses via its GAD budget policy), and strengthening the role of national women's machineries or civil society to watchdog and collaborate on implementation. It is also crucial to sensitize policymakers that gender inclusion is not a secondary issue but integral to digital development. It is only then will policies be implemented not just in letter but in spirit.

Resource allocation issues

Budgetary constraints have also been a significant barrier to advancing gender equality in ICT across the ASEAN region. While many national and regional digital strategies acknowledge the importance of inclusivity, actual funding for gender-specific ICT programs often remains limited or inconsistent. In several ASEAN countries, gender is still not systematically integrated into digital budgeting frameworks, resulting in ad hoc or short-term initiatives that lack the scale or sustainability to drive real change. Out of the ten ASEAN member states, only the Philippines has formally institutionalized gender-responsive budgeting (GRB) in its national governance structure through the Magna Carta of Women (Republic Act No. 9710). The law mandates that at least 5% of agency budgets be allocated to GAD programs, which can include ICT-related initiatives. However, even in the Philippines, implementation challenges continue to persist, with funds sometimes being diverted to generic activities that do not meaningfully address gender gaps in digital access or skills, such as community events unrelated to ICT (*Moreno 2023*).

In the entrepreneurship domain, women in the ICT sector face economic barriers in accessing the resources needed to start and grow businesses. Key among these is access to capital. Women entrepreneurs in ASEAN often report greater difficulties in securing loans or investment. The reasons range from lack of collateral (as discussed above) to gender bias among investors, as venture capital remains a male-dominated field globally, and investors may (consciously or not) favor male-led startups. In Southeast Asia, studies have found that women-led startups attract a disproportionately low share of venture capital funding relative to their numbers (UNESCAP 2022b). Additionally, women entrepreneurs may have smaller networks in the tech industry, limiting their knowledge of and connection to potential funders. This is compounded by what one might call a confidence gap, where women founders might be more hesitant to pitch or take on debt, especially without support, due to societal conditioning (*Banet-Weiser 2018*).



3.2. Technological Outcomes and Content Gaps

While ICT adoption can yield positive outcomes for gender equality, these potential gains can be undermined by the presence of gender biases and exclusion in the technology itself. Previous studies have found that algorithms in various digital platforms are not gender-neutral (Barzilay 2019; Schroeder 2021). Developers often encode existing social biases, either unconsciously or through training data that reflect unequal historical patterns, into algorithmic systems. As a result, technologies such as search engines, job recommendation systems, facial recognition tools, and content moderation frameworks may reinforce gender stereotypes or systematically disadvantage for both women and gender-diverse individuals. For instance, machine learning algorithms that are used in hiring platforms have been shown to favor male candidates due to training datasets that reflect male-dominated workforce trends in STEM fields (Swift 2022).

Moreover, ICT infrastructure and tools often reflect dominant cultural norms and economic interests, which can marginalize rural women, Indigenous groups, and those with limited digital literacy. These biases are embedded not only in algorithms but also in how digital interfaces are designed, which languages are supported, and what forms of content are prioritized. For example, many platforms predominantly cater to urban, English-speaking, and male-oriented users, leaving behind a large group of people whose experiences and needs differ significantly. This results in a digital ecosystem that is often blind to the socio-cultural realities of traditionally marginalized groups. Additionally, the absence of culturally relevant content discourages further engagement from communities who could otherwise benefit from ICT.

Across the region, these dynamics are increasingly visible as digital transformation accelerates. Akbar and Wijaya (2024) for example analyzed digital literacy across rural Indonesia by focusing on four pillars: digital skills, safety, culture, and ethics. The study found that while rural communities exhibit higher levels of digital ethics, they display lower proficiency in digital skills. Some of the primary obstacles identified include inadequate digital infrastructure and the integration of digital technologies into everyday routines. A 2020 report by The Engine Room noted that the lack of interfaces in local languages and the failure of biometric systems to accurately recognize certain physical features have contributed to the exclusion of indigenous women from digital financial services in Myanmar.

4

Best Practices and Success Stories



4.1 Best Practices

In recent years, there have been several best practices observed across the ASEAN region that demonstrate how gender-inclusive digital transformation can be both effective and sustainable. The examples shown in this section highlight a growing commitment among governments, civil society, regional institutions, and private sector actors in making sure that women and girls are not left behind in the region's accelerating digital shift. Many of these practices are grounded in local realities but have later achieved scale and replicability across borders, making them highly relevant for policy adaptation throughout the region. These observed best practices focus not only on bridging the gender gap in access but also on creating enabling environments for digital leadership, entrepreneurship, and resilience. They further show how the use of tangible and intangible assets such as gender-sensitive infrastructure, targeted funding, and participatory data systems can converge to advance equitable digital development across ASEAN.

4.1.1. Go Digital ASEAN

In 2020, The Asia Foundation, together with Google, launched the Go Digital ASEAN initiative, a region-wide program aimed at equipping underserved communities, particularly women and youth, with essential digital skills to navigate and thrive in an increasingly digital economy. The program was a direct response to the urgent need for inclusive digital recovery and resilience amid the coronavirus (COVID-19) pandemic.

Since its inception, Go Digital ASEAN has trained over 215,000 individuals, more than 60% of whom are women, across all ten ASEAN member states. What makes this initiative stand out is its strong focus on local implementation and community partnerships.

Training is delivered through a network of civil society organizations, using culturally appropriate, language-accessible modules that range from basic digital literacy to applied business skills, such as managing digital payments, marketing through social media channels, and using e-commerce platforms like Shopee, Lazada, and Qoo10.

For women, especially those running informal, micro, or home-based enterprises, the initiative has provided not just digital tools, but a pathway to economic independence and entrepreneurial resilience. Go Digital ASEAN succeeds in connecting skills development directly to real-life applications by embedding digital literacy within the context of economic empowerment. With the region's continued push for inclusive digital growth under the ADM 2025, this initiative provides a proven framework for bridging the gender digital divide in entrepreneurship. It exemplifies how cross-sector partnerships can deliver scalable and context-sensitive impact across the region, making it a valuable reference for future regional programs.

4.1.2. ASEAN Digital Literacy Programme

The ASEAN Digital Literacy Programme (ADLP) is another example of a regionally coordinated yet locally grounded initiative designed to counter digital exclusion and disinformation, particularly among vulnerable populations. Launched in 2022 by the ASEAN Foundation, the program was developed amid growing concerns over online misinformation, hate speech, and gender-based cyber harassment in Southeast Asia. Recognizing this gap, ADLP took a preventative approach by promoting not just access to digital tools, but the capacity to evaluate, interpret, and engage with digital content critically.

One of ADLP's features is the creation of a Youth Advisory Group (YAG), which is a cohort of young digital ambassadors from each ASEAN member state who play a central role in shaping program content, delivering workshops, and leading peer education efforts. This youth-led, bottom-up design ensures that the training remains relevant to the realities of younger generations, including young women navigating both the opportunities and risks of online platforms. The program has also worked closely with teachers, parents, community leaders, and civil society groups to create multi-stakeholder engagement networks that extend digital literacy education beyond schools and into households and grassroots organizations. This decentralized approach ensures that digital literacy is not treated as a temporary skill set, but as a foundational aspect of civic life and public education.

4.1.3. #MakinCakapDigital Nationwide Campaign (Indonesia)

In Indonesia, the Ministry of Communication and Digital Affairs (Kominfo) launched the #MakinCakapDigital ("More Digitally Capable") campaign in 2021, at the height of the pandemic. The initiative aims to reach 50 million Indonesians by 2024 across all of the country's 34 provinces, including more than 500 cities and regencies. The program is grounded in four key pillars of digital literacy, namely Digital Skills, Digital Ethics, Digital Safety, and Digital Culture. It reflects a whole-of-nation approach to empowering citizens with the competencies needed to thrive in a connected society. Rather than offering isolated or standalone workshops, the campaign integrates digital literacy into a sustained national movement, delivered through a hybrid model that combines online courses, live webinars, community-based outreach, and open-access platforms. These learning experiences are made available in multiple local languages, significantly increasing accessibility for all qualified participants across Indonesia's diverse linguistic and cultural landscape.

The #MakinCakapDigital initiative is strategically aligned with Indonesia's national digital transformation agenda and supported by partnerships with universities, civil society, and technology companies. These collaborations have helped scale content distribution and expand training formats, such as integrating digital literacy into formal education and leveraging public broadcasting platforms. In May 2024, Kominfo introduced the hashtag #MakinHepii, targeting Generation Z and Millennials, with campaigns led by influencers and artists to promote safe, ethical, and positive internet use, particularly among youth.

To ensure accountability and continuous improvement, Kominfo has implemented a combination of M&E tools such as feedback loops, progress tracking, and public reporting mechanisms. This allows the initiative not only to measure its outreach but also to refine its approach based on participant feedback and emerging digital trends. One example of this is the Indeks Masyarakat Digital Indonesia (IMDI) which annually measures digital literacy, infrastructure, and economic empowerment across 514 districts and municipalities.

4.1.4. S.U.R.E. Campaign (Singapore)

In 2013, the National Library Board of Singapore (NLB) launched the S.U.R.E. Campaign to promote information literacy among the general population. The acronym stands for Source, Understand, Research, and Evaluate, which outlines a simple but structured approach to assessing digital and media content. The campaign was created in response to concerns about misinformation and low levels of critical thinking when interacting with online information. While it does not target women specifically, the campaign has been accessible to women through public libraries, schools, and community programs. It includes outreach materials, online resources, mobile exhibitions, and workshops aimed at different groups of the community, including students, educators, parents, and older adults (Dresel et al. 2020).

The program was expanded under what is now known as S.U.R.E. 2.0, extending its reach beyond formal education into workplaces, homes, and digital platforms. This shift makes it relevant to women who engage with digital content in domestic, caregiving, or informal economic roles. For example, many participants use the skills taught by the campaign in their everyday lives to verify claims shared on social media, evaluate the reliability of financial advice found online, or help their children assess the credibility of school-related information. These are situations where unchecked digital content can have consequences, especially for women managing both household responsibilities and family wellbeing.

Best Practices

Success Stories & Emerging Solutions Across ASEAN

215k+

People Trained by Go Digital ASEAN

60%+

Women Participants in Regional Programs

50M

Indonesians Targeted by #MakinCakapDigital

10

ASEAN Member States Engaged

Flagship Regional Programs

Go Digital ASEAN

Partnership: The Asia Foundation, Google, ASEAN Secretariat

215K+

Total Trained

60%+

Women

10

Countries

2020

Launch Year

Innovation: Community-based delivery through trusted local organizations with culturally appropriate, language accessible modules

Focus: Digital skills for underserved communities, particularly women and youth, covering basic literacy to e-commerce applications

ASEAN Digital Literacy Programme

Partnership: ASEAN Foundation, Google

YAG

Youth Advisory

Multi

Stakeholder

Regional

Scope

2022

Launch Year

Innovation: Youth-led design with Youth Advisory Group (YAG) from each ASEAN member state leading content creation and delivery

Focus: Combating misinformation, hate speech, and gender-based cyber harassment through critical digital thinking skills

National Success Stories

Indonesia

#MakinCakapDigital Campaign

Scale: 50 million Indonesians by 2024 across 34 provinces, 500+ cities and regencies

Four Pillars: Digital Skills, Digital Ethics, Digital Safety, Digital Culture

Innovation: Hybrid model combining online courses, live webinars, community outreach, and multiple local languages

2024 Extension: #MakinHepii campaign targeting Gen Z and Millennials through influencers and artists

Monitoring: Indeks Masyarakat Digital Indonesia (IMDI) tracks progress across 514 districts

Singapore

S.U.R.E. Campaign

Framework: Source, Understand, Research, Evaluate - structured approach to digital content assessment

Launch: 2013 by National Library Board (NLB)

Evolution: S.U.R.E. 2.0 expanded beyond education into workplaces, homes, and digital platforms

Impact: Accessible to women through public libraries, schools, and community programs with materials for all age groups

Cambodia

Digital Literacy Initiatives

Sisters of Code: IT STEP Academy Cambodia provides safe, female-friendly learning environment for schoolgirls

Khmer Digital Literacy Programme: Ministry of Education partnered with Meta and KAPE adapting WeThinkDigital curriculum

DMIL Framework: UNESCO collaboration outlining 8 key digital skills from data understanding to online safety

Successful Partnership Models

1

Multi-Stakeholder Collaboration

Government, private sector, NGOs, and donors pool resources and expertise

2

Local Leadership & Ownership

Community leaders and women's groups lead implementation for cultural relevance

3

Sustained Resource Commitment

Multi-year funding and institutionalized budget allocations ensure continuity

4

Policy Integration

Embedding programs into national and local policy frameworks

Demonstrated Impact

140K+

Entrepreneurs trained by Go Digital ASEAN by 2024

9k+

Seniors trained annually in Singapore's Digital for Life

100K+

People trained through Indonesia's Digital Talent Scholarship

514

Districts tracked by Indonesia's IMDI monitoring system

5%

Mandatory GAD budget allocation in Philippines

2,200+

Tech4ED centers established in Philippines since 2018

5

Policy Recommendations



This section offers a series of key policy recommendations that aim to help close the gender digital divide in the ASEAN region. These suggestions build on the issues and insights discussed earlier and are meant to guide governments, private sector groups, and civil society in creating more inclusive digital systems in their communities. Every ASEAN country faces different challenges and works within its own context, so while the recommendations provide a shared framework, they should be flexible and adjusted to fit local needs. The goal is to promote gender equality in digital development across the region, while making sure each country can shape its approach based on its own realities.

5.1 Education and skills development

Digital Literacy

In today's digital world, girls and women need the right skills to succeed. One of the best ways to make this happen is by teaching digital literacy early on in the national education system. This means starting with basic computer skills and digital know-how in primary and secondary schools. To make it work, two things are needed: first, schools must have proper ICT infrastructure; and second, teachers need to be trained to teach these skills effectively.

Digital Tools and Infrastructure

Before digital skills can be taught well, schools need the right tools. This means having reliable internet, updated computers or tablets, and the basic software needed for learning. In many rural or low-income areas, these resources are still missing. Governments and private partners need to work together to improve digital infrastructure in schools, including regular maintenance and support to keep everything running. Without these basics, even good lesson plans won't be enough. But tech alone isn't the full answer. What really makes a difference is the teacher. Many educators—especially those trained before digital tools became common—may not feel confident using or teaching with them. That's why training teachers is just as important. They need support not only in using digital tools, but in teaching them in ways that are engaging and gender-sensitive. With the right training, teachers can build classrooms where all students, especially girls, feel welcome and ready to grow their digital skills.

Need-Based Support

To close the gender gap in STEM, scholarships and targeted support can help more girls enter these fields. But it's also important to think about how this support is given. Scholarships are often awarded based only on high grades or test scores. While academic achievement matters, this approach can leave out many capable girls who face challenges beyond their control. Research shows that poverty, family duties, poor schooling, and other social pressures can impact how well a student does in school (Aturupane, Glewwe, and Wisniewski 2013; Camacho-Thompson et al. 2016; Simons and Steele 2020). A girl might have real interest and talent in science or tech, but if she's dealing with housework, spotty internet, or mental health issues, her grades might not show her full potential. That's why scholarships should also consider a student's background and circumstances. Support based on both need and potential can help level the playing field and reach the students who need it most.

Community-led programs

In places where access to formal education is limited (like geographically isolated and displaced areas) community-based digital literacy programs can help bridge the gap. These programs should be simple, hands-on, and easy to follow, especially for people learning digital skills for the first time. Improving ICT infrastructure is important, but training also needs to connect with everyday life. That means teaching digital tools in ways that match what people already do, like farming, running small businesses, selling goods online, or managing household budgets. For example, in communities with local entrepreneurs, training can focus on using social media or e-commerce platforms to grow their businesses. When lessons feel useful and relevant, people are more likely to keep using technology. It also helps to teach in local languages and use examples people can relate to. Trainings work best when held in familiar, safe places like community centers, women's groups, co-ops, or churches. Involving local leaders can also make a big difference when people see someone they trust using digital tools successfully, they're more likely to give it a try themselves.

5.2 Workplace inclusion and advancement

Strong Government Mechanisms

Building a more inclusive tech industry in the region isn't just about hiring more women. It's about creating workplaces where they can succeed, grow, and lead. To make that happen, we need a multi-level approach that addresses legal, cultural, and institutional barriers all at once. A good place to start is strong government action. Most ASEAN countries already have anti-discrimination and equal opportunity laws, but how these laws are enforced—and how far they go—varies widely, as shown in Table 2. For real change, these laws need clear implementation plans, regular monitoring, and systems to hold institutions accountable. That means making sure equal pay rules are backed by audits, complaint systems are safe and accessible, and companies get the support they need to meet inclusion goals.

Leave Policies

Governments across the region must also need to rethink how parental leave is given to IT professionals as well. When both mothers and fathers are supported equally, it helps break the idea that caregiving is only a woman's role. This not only makes it easier for women to return to work but also helps shift outdated gender expectations. Figure 16 below shows the gap in paid parental leave between women and men across the ASEAN region, measured in calendar days. The map shows that men generally get much less leave than women. Myanmar gives the longest paid paternity leave at 21 days, while Thailand, Cambodia, and Brunei offer none. In most other ASEAN countries, leave for fathers is only a few days long.

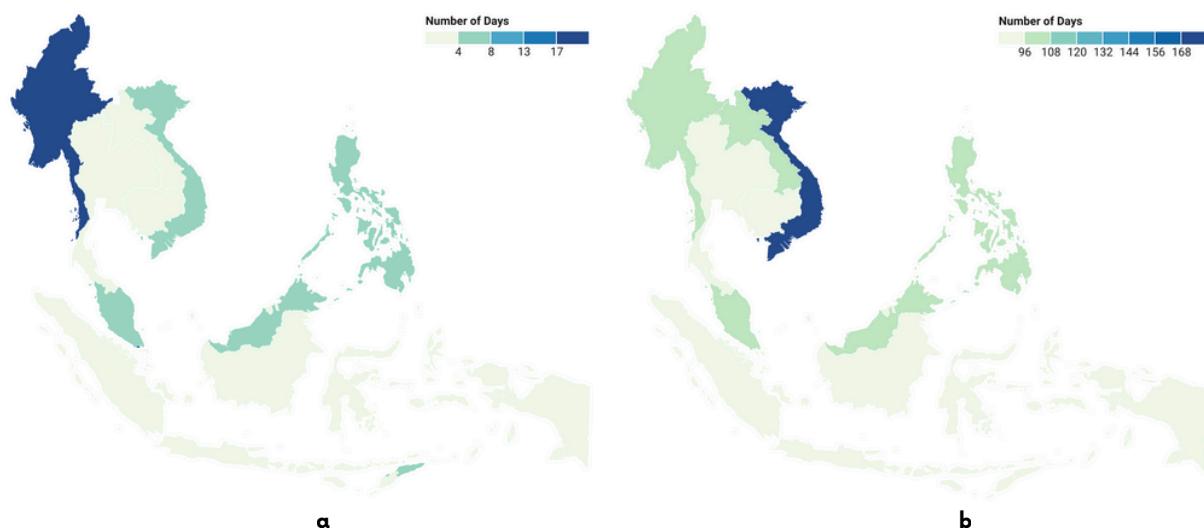


Figure 16. Length of paid parental leave in ASEAN showing (a) paternity leave for men and (b) maternity leave for women, measured in calendar days.

Workplace Safety

Consequently, workplace safety and respect are non-negotiable. In many ICT spaces where men still dominate, strong anti-harassment measures are needed to make sure that all women feel safe, respected, and heard. But these efforts can't stop at basic compliance. Companies need long-term systems in place such as confidential reporting channels, timely investigations, and clear consequences for misconduct. Just as important is building a workplace culture where everyone understands what harassment is and why it matters. Regular training, accountability from leadership, and visible support from management all help shift workplace norms. Without these steps, women may continue to work in environments that are not only unwelcoming, but also harmful to their growth and participation.

5.3 Entrepreneurship ecosystem building

Targeted Innovation Funds

To build a strong and inclusive entrepreneurship ecosystem for women in the region, equal access to funding, markets, and training must be a priority. Many women still face barriers when starting or growing a business, especially in male-dominated fields like tech. Access to capital remains one of the biggest challenges, with women entrepreneurs often receiving less support than men. One way to address this is through innovation funds designed for women-led startups. These can offer grants, low-interest loans, or equity investments tailored to women's needs. But financing alone is not enough. Many women-owned businesses also struggle to reach bigger markets due to limited networks or visibility. Trade fairs, exhibitions, and online marketplaces can help connect them with new customers and business partners.

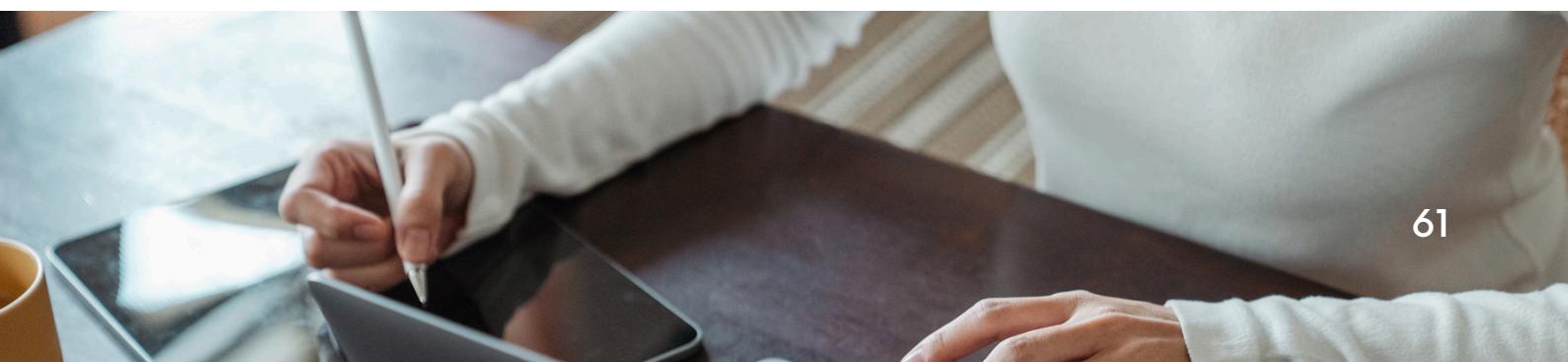
ASEAN could take a big step by launching a regional innovation fund focused on women-led digital startups. This wouldn't just provide capital. It would also promote collaboration across all countries in the region. The fund could support startups at different stages of growth, helping them scale and compete across the region. It could also create opportunities for knowledge sharing and allow successful business models to be adapted in other countries. Most importantly, it would give women from different ASEAN nations a chance to work together on shared challenges. A regional approach like this ensures that women entrepreneurs, no matter where they come from, have a fair chance to succeed.

Accessible Digital Platforms

E-commerce platforms are an important tool for women entrepreneurs and informal workers alike who want to reach more customers as possible. But many women still face barriers like limited digital skills or poor internet access. To address this, government and private sector efforts should focus on building e-commerce programs that are simple, inclusive, and easy to use. These platforms should guide users through setting up online stores, listing products, and using secure digital payments. Training should cover both basic digital skills and practical strategies like online marketing. It's also important to improve logistics so that women in remote areas can take part in online selling. Support in local languages and mobile-friendly tools will help make these platforms more accessible to more women.

Public Awareness Campaigns

Societal norms and biases still hold many women back from fully pursuing entrepreneurship. Cultural expectations often confine women to domestic roles, making them less likely to take business risks later on. Gender stereotypes can also lower their confidence and limit their chances. To change this, public campaigns should challenge these outdated ideas and promote real examples of successful women entrepreneurs. Schools should teach both entrepreneurship and gender equality early on. The media can also help by showing more stories of women succeeding in business. Supporting inclusive entrepreneurship should be seen not just as a women's concern, but as a key part of social and economic progress.



5.4. Digital safety and inclusion

Digital Rights Frameworks

Strategies to address cybercrime and online harassment need to consider gender-specific risks and impacts, both at the national and regional level. Women face specific threats like stalking, doxxing, and sexual harassment that require clear and pro-active legal recognition. Laws should define online gender-based violence and set strong penalties to hold offenders accountable. Without proper legal frameworks, many cases go unreported or unresolved. Governments should also fund awareness campaigns that inform women of their digital rights and how to protect themselves online. These campaigns need to be accessible, using different languages and formats. When women know their rights and the risks, they're more confident navigating digital spaces and taking action when needed.

Integrated Support

It is also important to link digital safety services with the support systems already in place for gender-based violence. Victims of online abuse shouldn't have to go through a completely separate process just to get help. Bringing services together makes it easier for them to access counseling, legal aid, and reporting tools in one place. For example, shelters for survivors could include digital safety sessions and provide safe internet access. Legal services should help victims file complaints and understand their rights online. Counselors also need training to deal with the emotional effects of cyberbullying and exploitation. At the same time, police and legal offices should have clear steps for handling online threats and digital evidence. Support should be trauma-informed and respect what the victim is ready for. Online abuse often goes hand-in-hand with offline violence, so joined-up services are key.

Collaboration

Tech companies play a major role in creating a safe online environment. They must build tools that allow users to report abuse easily and get timely help. These tools should be visible, user-friendly, and available in multiple languages. Content moderation must be thorough and consistent to ensure harmful content is removed quickly. Platforms should be transparent about how they handle reports and what actions are taken. Audits and updates can help improve systems over time. Collaborating with women's rights groups can help companies understand the impact of online abuse. Digital platforms should also publish safety reports to show what progress is being made. Offering safety settings like content filters and account protections by default can reduce unwanted risk.



5.5. Data standardization and monitoring

Data Accuracy

To achieve the first four points discussed in this section, however, there should be a strong foundation built on consistent, reliable, and gender-sensitive data practices. Without accurate data, it is nearly impossible to measure gaps, evaluate progress, or understand where interventions are most needed. Governments, including both public and private institutions, must agree on what to measure, how to measure it, and how often to report it. For example, if one country in the ASEAN region defines "ICT employment" differently than another, then comparing women's participation in that sector becomes meaningless at all. Some countries have their own reporting mechanisms, which may align poorly with international frameworks. This patchwork of practices in the region creates confusion among member states and hinders regional collaboration, making it hard to draw accurate comparisons or identify shared challenges. To avoid this, countries in the ASEAN region must harmonize their definitions on gender and ICT, while synchronizing their reporting cycles at the same time. This effort can be supported by adopting international standards, such as those provided by the ITU or the World Bank's Gender Data Portal, which offer clear guidelines for classifying and collecting gender data.

Data Standardization

However, standardizing indicators is just the beginning. Monitoring progress also means ensuring that the data is updated regularly. In this way, these indicators can better reflect current realities, especially as technology and usage patterns evolve rapidly. What may have been relevant five years ago, such as basic mobile phone usage, may now be insufficient especially in a world dominated by digital platforms, e-commerce, and AI-powered services. Moreover, regular monitoring and evaluation can help flag emerging disparities in these indicators early, such as new forms of exclusion based on digital literacy or cybersecurity concerns disproportionately affecting women. To do this however, national statistical offices must be equipped with the tools needed to gather, analyze, and publish gender-disaggregated ICT data more effectively. Using mapping tools and, where appropriate, remote sensing technologies, can also enhance data accuracy and offer spatial insights into gendered ICT access and infrastructure availability. It can also help policymakers pinpoint where investments in digital infrastructure, literacy training, or safety initiatives might be most needed for women and girls.

Trainings on Data and Inclusivity

It is also important to recognize at this point that good data starts with trained people and smart tools at the national statistical office. Training staff to collect and analyze sex-disaggregated data helps prevent mistakes and ensures reliability. But this training must go beyond technical skills. For one, it also needs to cover the fundamentals of gender itself. Many staff members, especially those without a background in social sciences, may not fully understand what gender means in a statistical or policy context. Gender is not just about biological differences between men and women; it refers to the roles, behaviors, expectations, and opportunities that societies assign to people based on their perceived sex. These roles can deeply influence who has access to technology, who gets trained, who gets hired, and who benefits from digital tools. Without understanding these important concepts, data collectors might overlook critical questions or misclassify responses, which skews results and undermines policymaking.

Data Collaboratives

The community can also play its part in filling out the data gaps in gender and ICT. Local organizations, civil society groups, educators, and even tech users themselves have valuable insights into the digital realities women face in their everyday lives. These groups often operate at the grassroots level and can see patterns and challenges that national-level surveys miss. For example, they might notice that women are less likely to attend digital skills workshops due to unpaid care work or safety concerns. Community-based organizations can help identify these barriers and ensure they are reflected in the data. Importantly, data collection efforts should not be limited to formal surveys or bureaucratic channels. There should be a space for participatory methods where women and marginalized groups can voice out their own experiences. Making these processes free, simple, and accessible helps build trust and encourages broader participation in the community. When people feel that their input matters, they are more likely to share honestly and regularly, which strengthens the quality and relevance of the overall data.



Policy Recommendations

Strategic Framework for Gender-Inclusive ICT Development



Education & Skills

Digital literacy integration & gender-sensitive curricula



Workplace Inclusion

Anti-discrimination laws & family-friendly policies



Entrepreneurship

Innovation funds & accessible platforms



Digital Safety

Innovation funds & accessible platforms



Data Standards

Harmonized monitoring & evidence-based decisions

I. Education & Skills Development

Digital Literacy Integration

Integrate digital literacy into national education systems from primary through tertiary levels with gender-sensitive approaches.

Infrastructure Investment:

Ensure all classrooms have reliable internet, updated devices, and essential software with maintenance support

Teacher Training:

Provide comprehensive professional development in digital tools and gender-sensitive pedagogy

Need-Based Support Systems

Establish scholarships and targeted support combining merit and need-based criteria to reach talented girls facing barriers.

Holistic Assessment:

Consider economic hardship, family responsibilities, and systemic barriers alongside academic performance

Wraparound Services:

Provide mentorship, career counseling, and practical support beyond financial assistance

Community-Led Programs

Develop community-based digital literacy programs in areas where formal education is limited, emphasizing practical applications.

Local Language Delivery:

Use familiar languages and culturally relevant examples in safe community spaces

Practical Focus:

Connect digital skills to daily activities like farming, business, or household management

II. Workplace Inclusion & Advancement

Strong Legal Frameworks

Implement and enforce comprehensive anti-discrimination and equal opportunity legislation with clear accountability mechanisms.

Equal Pay Enforcement:
Conduct regular audits, transparent reporting, and accessible complaint procedures

Implementation Support:
Provide guidance and resources to help companies meet inclusion standards

Progressive Leave Policies

Reform parental leave policies to support both mothers and fathers equally, challenging traditional gender norms.

Balanced Allocation:
Provide substantial paid leave for both parents to share caregiving responsibilities

Workplace Flexibility:
Support remote work, flexible hours, and family-friendly workplace policies

Workplace Safety Standards

Establish and enforce zero-tolerance policies for harassment with confidential reporting and swift response mechanisms.

Prevention Training:
Regular education on respectful workplace behavior and unconscious bias for all employees

Leadership Accountability:
Hold management responsible for creating and maintaining inclusive work environments

III. Entrepreneurship Ecosystem Building

Targeted Innovation Funds

Establish dedicated funding mechanisms specifically designed to support women-led digital startups and businesses.

Regional Innovation Fund:
Launch ASEAN-wide fund supporting women-led digital startups with cross-border collaboration incentives

Alternative Collateral:
Reform lending requirements to accept non-traditional forms of credit security for women entrepreneurs

Accessible Digital Platforms

Create user-friendly e-commerce and digital business platforms with comprehensive support for women entrepreneurs.

Platform Integration:
Provide training on online store setup, digital payments, and marketing strategies

Rural Connectivity:
Ensure logistics and delivery support for women entrepreneurs in remote areas

Public Awareness Campaigns

Challenge societal norms and promote positive role models to encourage women's entrepreneurship participation.

Media Representation:
Showcase successful women entrepreneurs and challenge limiting gender stereotypes

Early Education:
Include entrepreneurship and gender equality in school curricula from elementary levels

IV. Digital Safety & Inclusion

Digital Rights Frameworks

Develop comprehensive legal frameworks that specifically address gender-based online violence and digital rights.

Legal Definition:
Clearly define online gender-based violence with specific penalties and enforcement mechanisms

Digital Rights Education:
Fund awareness campaigns teaching women about digital rights and safety strategies

Integrated Support Systems

Connect digital safety services with existing gender-based violence support infrastructure for comprehensive assistance.

One-Stop Services:
Provide counseling, legal aid, and digital safety support in unified locations

Training Integration:
Train existing GBV counselors and legal advocates in digital safety and cyber evidence handling

Platform Collaboration

Establish mandatory partnerships with technology companies to create safer online environments for women.

Reporting Tools:
Require user-friendly, multilingual abuse reporting with transparent response timelines

Safety by Design:
Mandate privacy settings, content filters, and account protection features as platform defaults

V. Data Standardization & Monitoring

Harmonized Data Standards

Establish common definitions and reporting frameworks for gender-disaggregated ICT data across ASEAN member states.

Common Definitions:
Adopt ITU and World Bank standards for ICT employment and digital inclusion indicators

Synchronized Reporting:
Coordinate data collection cycles and methodology across national statistical offices

Capacity Building Programs

Train national statistical office staff in gender-sensitive data collection, analysis, and interpretation methods.

Technical Training:
Provide comprehensive education on gender concepts, intersectionality, and statistical best practices

Technology Tools:
Support adoption of mapping tools, remote sensing, and digital data collection platforms

Community Data Partnerships

Engage local organizations and communities in participatory data collection to capture lived experiences.

Participatory Methods:
Use community surveys, focus groups, and digital storytelling to complement official statistics

Accessible Processes:
Ensure data collection is free, simple, and builds trust with marginalized communities

5

Conclusion



Since the creation of the first regional committee on women in ASEAN exactly fifty years ago, the region has taken meaningful steps toward gender equality. Almost all of its member states have adopted some form of legal intervention to promote women's rights, ranging from anti-discrimination laws to gender equality mandates in public institutions. In the digital space, these efforts have evolved into a series of initiatives that aim to close the gender gap in access to and use of ICT. Across the region, best practices are emerging; from targeted digital literacy programs for women and girls in Cambodia and Laos, to the integration of gender-responsive budgeting in ICT policies in Viet Nam and Thailand. These examples show how different approaches, when informed by data and driven by inclusion, can create real progress. However, as it was shown in this report, progress remains patchy across the region. For one, the integration of gender into ICT policy is often treated as a side note rather than a core objective.

Data gaps remain one of the biggest obstacles in making this vision a reality, as many countries in the region still do not collect or publish sex-disaggregated data regularly, making it difficult to design or evaluate meaningful interventions. Without solid data, it is almost impossible to know whether women are truly being included in the ICT sector or just rhetorically acknowledged. There is also the issue of lack of funding. Even when policy documents mention inclusion, the budget allocations to support such initiatives are often minimal or nonexistent. In some cases, even well-designed plans sit idle either due to resource constraints or bureaucratic inertia. Cultural and social norms also play a heavy role as well. In certain areas of the region, deep-rooted beliefs about gender roles discourage girls and women from pursuing digital careers or even from using technology freely. Stigma, safety concerns, and family pressures can all limit women's access to ICT opportunities, especially in rural and conservative communities.

These issues point to a broader need for ASEAN to move beyond its fragmented pilot projects and symbolic gestures. What is required is a coordinated and region-wide commitment that treats gender integration in ICT not as a luxury, but as a necessity. This means investing in national statistical systems, funding inclusive digital programs, and tackling harmful gender norms through proactive education and advocacy. It also means ensuring that all policies are not just written as it is, but also implemented, tracked, and improved over time. Only then can ASEAN truly build an ICT sector that reflects its diversity, while delivering inclusive growth that benefits everyone. A more equitable digital future is possible in the region, but it must be built deliberately, not left to chance, together with all relevant stakeholders in the community.

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