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**An Inclusive Digital Economy
in the ASEAN Region****Mima SEFRINA***Independent Consultant*

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Abstract: *The rapid development of the digital economy in ASEAN offers broad economic and societal opportunities but also accentuates disparities between urban and rural areas, large enterprises and SMEs, and various segments of the population. While inclusiveness has been a priority on ASEAN's agenda, there is room for improvement. The concept of an inclusive digital economy in ASEAN should extend beyond broadband connectivity and necessitates a precise definition through quantifiable measures. Identifying the key elements of exclusion and inclusion as a strategic approach to effectively address inclusiveness issues is essential to understand the barriers hindering the achievement of an inclusive digital economy. There is also a need to identify specific populations, understand their characteristics, and address their needs for inclusion in the digital economy. A robust, region-specific data system that is accessible to the public is critical. In ASEAN, an inclusive digital economy underscores the need to address digital skills, gender inequality, digital finance, and the empowerment of MSMEs as key economic drivers in ASEAN.*

Keywords: Inclusive, ASEAN, Inclusive Digital Economy, Digital Economy, MSMEs, Broadband Connectivity, Digital Finance, Gender Disparities, Digital Skills, Internet Speed, Urban and Rural Divide, Digital Divide, Broadband Affordability

JEL Classifications: O20, O38

1. Introduction

The Association of Southeast Asian Nations (ASEAN) region is eagerly embracing the digital economy. Driven by the adoption of e-commerce, apps for transport and food, online travel reservations, online media, e-payments, and the digital finance sector, the region's digital economy is poised to grow exponentially (Google, Temasek, Bain & Company, 2022). The number of internet users in the region increased rapidly from 360 million in 2019 to 400 million in 2020 – the start of the COVID-19 pandemic – then to 440 million in 2021 and 460 million the following year (Google, Temasek, Bain & Company, 2022). Of its 600 million people, 400 million are digital consumers, with the e-commerce sector generating more than \$130 billion in revenue in 2022; 30 'unicorns' – start-ups valued at \$1 billion or more – have also blossomed (Yang, 2023). South-East Asia's digital economy was originally predicted to reach a gross merchandise value of \$200 billion by 2025, but that prediction was realised 3 years ahead of schedule (Google, Temasek, Bain & Company, 2023). Indeed, the ASEAN digital economy is projected to grow by 6% annually, reaching \$1 trillion by 2030 (Yang, 2023), signalling that the growth of the digital economy will create unprecedented opportunities for the region.

Amidst this burgeoning digital landscape, the ASEAN Digital Economy Framework Agreement (DEFA) will be a cornerstone. The DEFA is expected to catalyse this growth, potentially helping double the value of the ASEAN digital economy from \$1 trillion to \$2 trillion by 2030 (ASEAN, 2023b). However, the DEFA also signals challenges in harnessing the digital potential within and between ASEAN Member States (AMS), as it may end up exacerbating existing disparities across the region. AMS with more robust infrastructure and resources will be better prepared to implement the agreement and thus reap its full benefits. Meanwhile, AMS with less developed digital economies may face barriers to realising the benefits.

The growth and benefits of the digital economy have not yet been evenly distributed throughout the region. This is evident, for example, between urban and rural areas, and between large and micro, small, and medium-sized enterprises (MSMEs). Moreover, different segments of the population are affected by the uneven distribution of growth in the digital economy. Women are still under-represented in the digital technology industry and in science, technology, engineering, and mathematics (STEM). Micro and small enterprises often face difficulties in adopting digital technologies due to limited resources or lack of digital skills. Given the rapid progress of the digital economy and current stage of ASEAN's digital integration, such inclusion issues must be addressed.

This paper aims to shed light on the concept of an inclusive digital economy amidst the ever-evolving landscape of ASEAN's digital transformation. While previous literature has explored inclusivity within the digital economy, this paper seeks a more complex approach, highlighting the importance of establishing a well-defined concept of an inclusive digital economy along with measurable parameters and achievable targets that go beyond connectivity. Clear definitions, targets, and measures are needed for the creation of an inclusive digital economy, as these aspects will provide a strong basis for guiding efforts towards greater inclusivity.

In addition, this paper seeks to define the key elements within the digital economy that contribute to both exclusion and inclusion of various population groups. For example, it discusses the importance of addressing income inequality – in particular between urban and rural areas – as part of the efforts to address inclusiveness. By delving into these dimensions, the ongoing discourse on building an inclusive digital economy in ASEAN will be enriched, and insights and recommendations will be provided that address the needs of policymakers, researchers, and stakeholders.

2. Defining an Inclusive Digital Economy in ASEAN

The term ‘inclusive’ was introduced in the 1990s as part of poverty reduction efforts. ‘Social inclusion’ was introduced in 1995 at the World Summit for Social Development to create a ‘society for all’, which became a key social development goal. The summit defined an inclusive society as one in which everyone plays an active role; everyone has rights and responsibilities (UNDESA, 2009). An inclusive society is based on recognising human rights, fundamental freedoms, cultural and religious diversity, social justice, and special needs of vulnerable and disadvantaged groups. It also emphasises democratic participation and the rule of law (UNDESA, 2009). Consequently, policies and legal frameworks must address inequalities and promote tolerance for all.

Guided by the concept of an inclusive society – that is, a people-centred approach – this paper defines an inclusive digital economy based on the principle that everyone – regardless of education level, income level, sex, physical condition, or spatial location – has a role to play and the right to benefit from the opportunities offered by the digital economy.

There is no universal definition of an inclusive digital economy, which should recognise the need to tailor inclusivity to specific needs and circumstances. Inclusiveness must be sensitive to local contexts, considering specific groups of the population that should be

seamlessly integrated into the digital economy. An inclusive digital economy is not a one-size-fits-all concept, but an adaptable one, shaped by the unique socio-economic conditions, technological infrastructure, and cultural nuances of each region. However, the lack of universally accepted metrics for measuring inclusiveness poses significant challenges. Without standardised metrics, assessing progress towards an inclusive ASEAN digital economy becomes a more complex process. Policymakers, researchers, and stakeholders have struggled to measure the impact of policy interventions, and the lack of clear benchmarks has hindered the formulation of effective policies towards this goal. Moreover, the lack of accurate metrics can inadvertently perpetuate the digital divide by obscuring the true extent of a specific problem, making it difficult to allocate resources and to track improvements.

Despite these challenges, it is clear that a flexible and context-sensitive approach to inclusiveness remains paramount to narrowing the digital divide and to promoting equitable economic growth in the digital age. Achieving an inclusive digital economy requires identifying the unique needs and concerns of various population groups. This includes assessing areas where digital inclusion is weak, identifying prevailing exclusionary trends, and understanding which population groups are most affected by such exclusion. It is equally important to explore the underlying causes of digital exclusion. Do social structures, processes, and power dynamics favour the inclusion of some and the exclusion of others? Do legal frameworks inadvertently contribute to the exclusion of certain groups?

While numerous studies have explored the concept of an inclusive digital economy, most have focussed on aspects – such as accessibility and regulatory frameworks – that promote inclusivity. Some have broadened their scope to include digital finance, e-commerce, and digital skills as fundamental components. Yet a notable gap remains in identifying specific population groups that need be better included in the digital economy and understanding their specific characteristics and needs to achieve this goal.

One 2019 study underscored the trend of accessibility and regulatory framework centrality, emphasising the need for inclusive digital inclusion indicators that extend beyond mere measurements of internet access and digital device ownership (Digital Future Society, 2019). At least nine initiatives have been introduced to measure digital inclusion based on geographical/region coverage:

- (i) ICT Development Index, by International Telecommunication Union (ITU);
- (ii) Global Competitiveness Index, by the World Economic Forum;
- (iii) Inclusive Internet Index, by Facebook and Economist Intelligence Unit;

- (iv) Digital Economy and Society Index, by the European Commission and Eurostat;
- (v) E-Government Development Index, by the United Nations Department for Economic and Social Affairs;
- (vi) State of Mobile Internet Connectivity Index, by GSMA;
- (vii) Global Innovation Index, by World Intellectual Property Organization, INSEAD, and Cornell University;
- (viii) Affordability Drivers Index, by Web Foundation Alliance for Affordable Internet; and
- (ix) Australian Digital Inclusion Index, supported by Telstra and conducted by Roy Morgan Research, RMIT University, and Swinburne University of Technology.

Another digital inclusiveness index was formulated by Roland Berger in 2020. This index gauges digital inclusion through dimensions like accessibility, affordability, digital literacy, and attitudes or trust in utilising information and communications technology (ICT) (Roland Berger, 2020).

Internet access – or the availability of services, skills, and usage – remains the dominant measure of digital inclusion initiatives. Providing internet services is a priority, as around 2.9 billion people – 37% of world’s population – have not yet connected to or never use the internet; 96% of this number live in developing countries (ITU, 2021). The focus on the availability of internet access stems from the development of ICT services, marked by the emergence of mobile phones and the internet in the late 1990s (Digital Future Society, 2019).

In ASEAN, the discussion surrounding internet accessibility continues to evolve, transitioning from addressing basic connectivity to focussing on high-speed internet services of broadband access. Ensuring internet accessibility within the ASEAN region remains an issue, given that the quality of the service – specifically affordable high-speed internet connectivity – is an ongoing challenge. However, which segments of the population need to be provided these services and understanding their characteristics and needs are topics that have received little discussion.

The recent United Nations Capital Development Fund (UNCDF) initiative seeks to address this gap. Initially, UNCDF based its assessment of an inclusive digital economy on the fundamental pillars of digital skills, innovation, infrastructure, and policy and regulation.¹ This approach was then expanded to identify specific populations within the digital economy that need attention. In 2021, UNCDF introduced the Inclusive Digital Economy Scorecard, which

¹ UNCDF, Inclusive Digital Economies for the Sustainable Development Goals, <https://www.uncdf.org/ide4sdg>

has two main components: the Digital Economy Scorecard and Digital Inclusiveness Score.² The Digital Economy Scorecard assesses the level of development of a country's digital economy and its related elements, including an enabling policy environment, digital infrastructure, payment systems, innovation ecosystems, and skills. In contrast, the Digital Inclusiveness Score measures the level of inclusion of different population groups in the digital economy, covering categories such as women, youth, older persons, refugees, migrants, MSMEs, rural residents, and people with disabilities. As the Inclusive Digital Economy Scorecard is a new initiative, its assessment currently covers only 25 countries – but includes Cambodia and Myanmar. Its planned expansion has the potential to create opportunities for other AMS to forge partnerships in measuring inclusive digital economy within the region.

Addressing digital inclusiveness is closely linked to tackling income inequality, both at the national and regional levels. In the ASEAN region, income inequality manifests itself through three key dimensions. First, there is inequality in the distribution of income amongst AMS. Second, there is income inequality within each AMS; thirdly, it is seen in the divergence of economic opportunities for marginalised population groups or certain types of individuals within an AMS (OECD, 2018a). Policy actions usually identify groups within populations that have fewer opportunities for personal and business development, like youth, women, persons with disabilities, and ethnic minorities. Additionally, MSMEs may have difficulty accessing finance and markets.

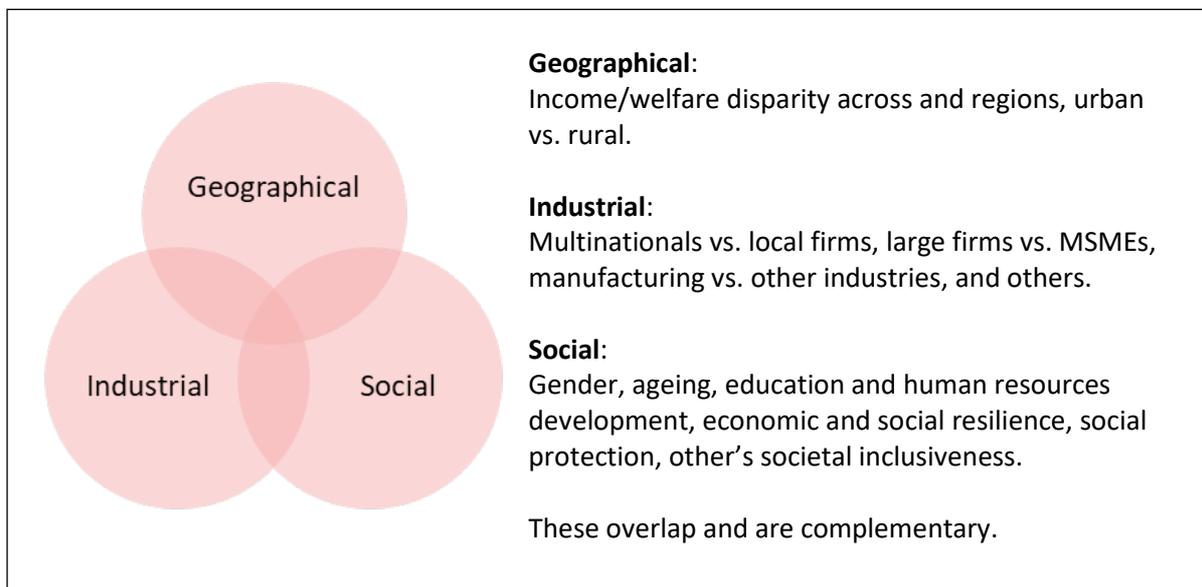
Income inequality across AMS is marked by purchasing power parity. In the region, there is a stark contrast in purchasing power parity between high-income countries, such as Singapore and Brunei Darussalam, with lower-income countries like Cambodia, the Lao People's Democratic Republic (Lao PDR), and Myanmar. However, significant economic progress has occurred within these lower-income economies as a result of industrialisation and integration of the manufacturing sector into global value chains (GVCs), signifying a catching-up process taking place (OECD, 2018a). Nevertheless, income inequality within AMS remains a challenge, especially between urban and rural areas. The COVID-19 pandemic has exacerbated the income gap, as – for example – many MSMEs went bankrupt and were unable to recover.

Thus, it is evident that digital inclusiveness is a complex, multi-dimensional issue that requires a holistic approach to ensure the equitable distribution of income and welfare amongst various demographic groups. An approach must consider factors such as urban versus rural,

² UNCDF, Inclusive Digital Economy Scorecard, <https://ides.uncdf.org/>

large enterprises versus MSMEs, gender disparities, age groups, educational attainment levels, and human resources. There are three key elements of inclusiveness – geographical, industrial, and social (ERIA, 2022). While these three elements are interconnected, it is also crucial to recognise that addressing one element does not automatically resolve the others. Consequently, achieving inclusiveness necessitates an approach that encompasses all three key elements (Figure 1).

Figure 1: Three Key Elements of Inclusiveness



Source: ERIA (2022).

The expected improvements in income levels should naturally address affordability concerns. The discourse on an inclusive digital economy must, therefore, effectively address income inequality, recognising its central role in narrowing the gap. Broadband internet connectivity is the backbone of the digital economy, acting as a bridge that reduces the urban–rural divide and levels the playing field for MSMEs with larger enterprises in terms of technology adoption.

While affordability remains a major challenge to achieving inclusiveness, it is not the only barrier, however. Quality issues related to broadband internet connectivity – such as internet speed and latency – also need to be addressed. Consequently, this paper aims to examine geographical elements in relation to urban–rural income disparities, with a particular focus on its complex interplay with broadband internet connectivity.

3. ASEAN's Commitments to Addressing an Inclusive Digital Economy

As a region, ASEAN has displayed a steadfast commitment to addressing inclusiveness as an integral part of its overarching goals. Its approach is grounded on the principle of leaving no one behind. This commitment is firmly rooted in the three pillars that form the foundation of the ASEAN Community: ASEAN Political and Security Community (APSC), ASEAN Economic Community (AEC), and ASEAN Socio Cultural Community (ASCC). This vision has evolved to shape the *AEC Blueprint for 2025*, underscoring ASEAN's dedication to ensuring that economic growth benefits all segments of society. This shared vision of inclusivity is also addressed in the ASCC and APSC pillars. The *ASCC Blueprint 2025* emphasises inclusive growth, a concept that encompasses the well-being of all ASEAN citizens, regarding aspects like welfare, social protection, women's empowerment, gender equality, human rights promotion, equitable access to opportunities, poverty eradication, health, decent work, education, and information (ASEAN, 2016b). It identifies groups such as ethnic minorities, children, youth, women, persons with disabilities, and older persons as requiring particular attention to ensure inclusive growth and social entrepreneurship. The *APSC Blueprint 2025*, reflecting its commitment to a rules-based and inclusive community, aims to uphold a people-oriented approach across all sectors of society, irrespective of gender, race, religion, language, or cultural background (ASEAN, 2016a).

The *ASEAN Masterplan on Connectivity* and *ASEAN Digital Masterplan 2025* reinforce the importance of inclusive connectivity in the region. The digital masterplan aspires to achieve a digitally inclusive society by reducing disparity in accessibility and affordability to digital technology, ensuring sustainability, and creating digitally literate citizens empowered to use digital technologies (ASEAN, 2021a).

Meanwhile, as digital technologies continue to rapidly evolve, reshaping the economic landscape and causing various social disruptions, the need for a well-defined concept of an inclusive digital economy is increasingly apparent. Equally important is the task of identifying specific population groups that should be seamlessly integrated into the digital economy. While the ASCC blueprint identified specific segments of population requiring attention for inclusive growth, these segments' roles in an inclusive digital economy have not been fully elaborated. A closer examination of these segments will provide insights into their specific characteristics and needs within the digital economy.

While numerous studies and discussions have explored various facets of inclusivity in the digital economy, the majority have tended to focus on issues related to internet accessibility,

such as availability, affordability, and service quality. They have also emphasised the role of regulatory frameworks in supporting the development of infrastructure for internet accessibility. Although the findings and policy recommendations are noteworthy, they often fall short in addressing the comprehensive integration of marginalised and underrepresented groups into the digital economy. It is also important to highlight that much literature focussing on inclusive digital economies categorise AMS under broader classifications such as East Asia and the Pacific, Asia-Pacific, or as part of low- and middle- income countries. This approach – while providing valuable insights on a broader scale – tends to overlook the distinct characteristics, strengths, and challenges that define ASEAN as a unique region. This oversight is becoming particularly pronounced given the rapid growth of the digital economy within the ASEAN region.

Due to the relatively recent emergence of the digital economy in ASEAN, comprehensive data encompassing all 10 AMS remain scarce. This data scarcity presents considerable challenges in fully assessing the extent of digital disparities across the entire ASEAN region. Moreover, there is no consensus on the metrics used to measure an inclusive digital economy in ASEAN. Both a regulatory framework as well as a comprehensive understanding of specific groups of the population to be integrated must be fostered to create a true inclusive digital economy.

While there are numerous studies on inclusive ASEAN or an inclusive ASEAN digital economy, limited attention has been paid to actually measuring the inclusiveness of the digital economy in the region. Efforts to measure the inclusiveness of the digital economy based on quantifiable and qualitative data – particularly in the ASEAN context – are scarce. While existing studies contribute to understanding the concept of an inclusive digital economy, the extent to which its specific impact on various segments of the ASEAN population is measured and understood requires further attention. In this regard, the development of segment indicators tailored to various target groups is of paramount importance. These indicators should include factors such as geographical location (rural and remote areas), sex, formal and informal educational attainment, type of employment (formal or informal), physical conditions (e.g. for persons with disabilities), age, and income groups.

Furthermore, benchmarks that measure an inclusive digital economy in a general sense – such as through broadband internet access, ownership of digital devices, and regulatory frameworks – are of limited value (Digital Future Society, 2019). They should encompass various segments of populations and unique challenges faced by those segments regarding the digital economy.

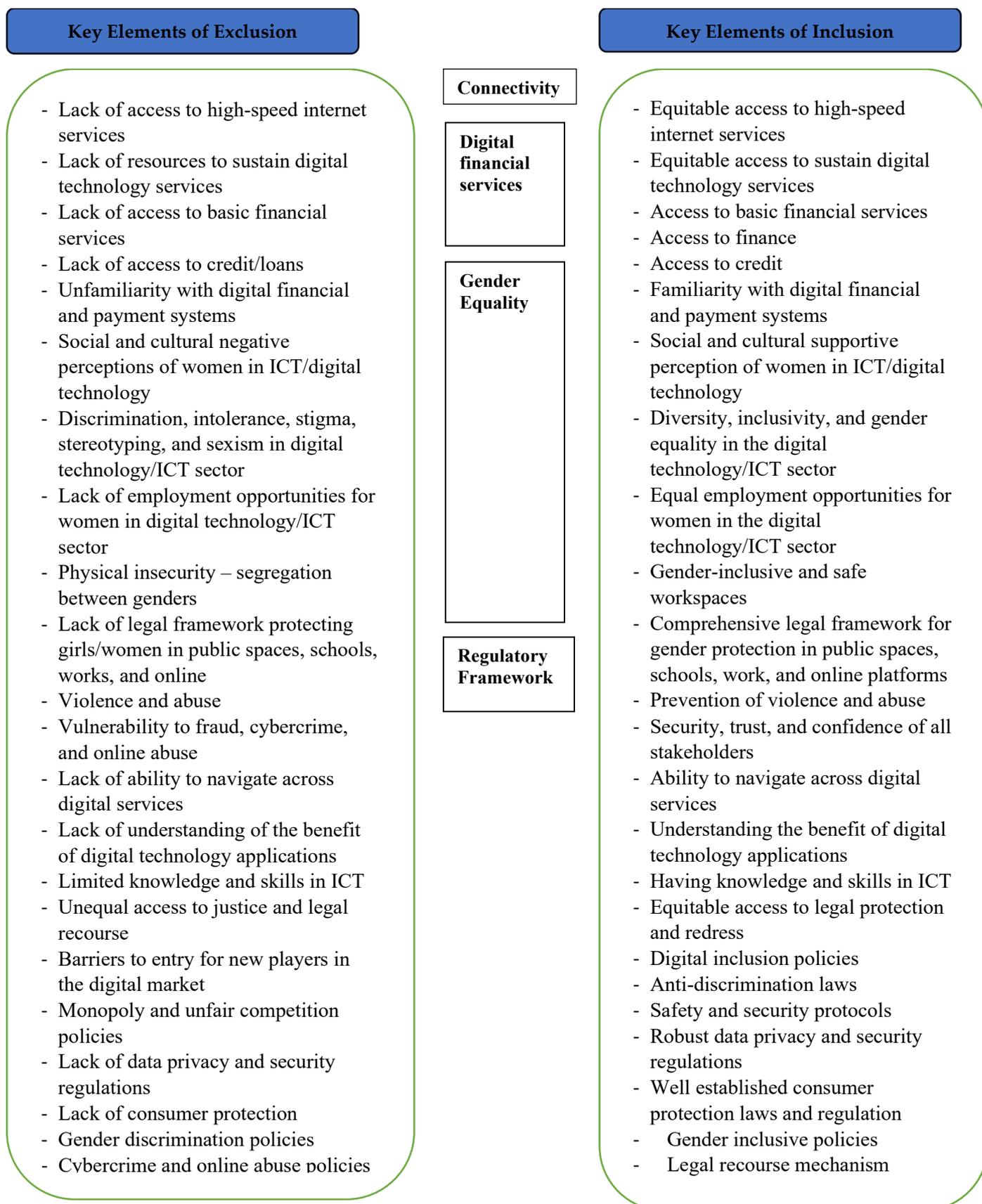
4. Key Elements in Digital Economy Inclusion and Exclusion

Understanding key elements responsible for the exclusion of specific segments of the population is critical in creating an inclusive digital economy. Key elements of exclusion may emerge as unintended consequences of providing equitable access and opportunities for all or in the pursuit of digital innovation and growth. One such example is the quest for equal access to high-speed internet services. While the intention is to provide equitable access, the reality is that high-speed internet services are widely available only where economic activity is often concentrated. Figure 2 shows key elements of exclusion and inclusion in the categories of connectivity, digital financial services, gender equality, and regulatory framework.

Recognising and addressing these key elements of exclusion and inclusion is essential to fostering an inclusive digital economy in ASEAN. An inclusive digital economy should go beyond mere connectivity, encompassing equitable economic opportunities, access to resources, financial services and the skills needed to navigate the digital landscape. As an example, bridging the digital divide requires more than infrastructure development. It requires a comprehensive approach tailored to the different needs and challenges of different segments of the population. Equitable economic opportunity is directly correlated with improved income levels, which creates a ripple effect, as better income levels can reduce affordability barriers to internet and education services. Yet specific population segments – for instance, rural populations – often face limited economic prospects, forcing them to migrate to urban areas. Moreover, women face stereotypes that prevent them from pursuing careers in the male-dominated technology industry. Understanding these exclusionary factors provides policymakers with insights that enable them to design targeted policies to promote an inclusive digital economy.

These key elements also highlight the importance of a comprehensive regulatory framework that ensures both protection and empowerment in the digital environment. An effective framework should not only promote equal access and opportunity but also protect against discrimination, cybercrime, and abuse. It should promote diversity, inclusivity, and gender equality in the digital technology sector and foster safe and supportive workplaces. It should also uphold legal protections for individuals and businesses, both online and offline, to build trust and confidence amongst all stakeholders.

Figure 2: Key Elements of Exclusion and Inclusion in Inclusive Digital Economy



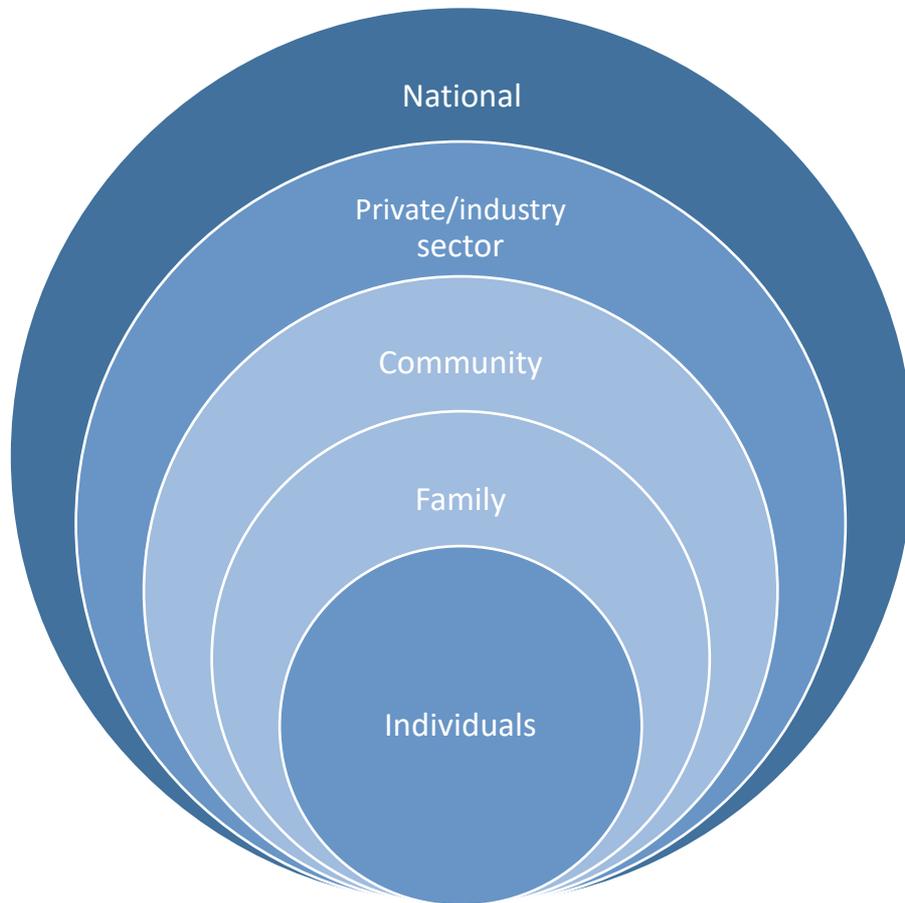
ICT = information and communications technology.
 Source: UNDESA (2009).

Tackling the elements of exclusion requires the involvement of all stakeholders, not only at national and regional level but also at the basic unit of society – the family. This approach is particularly important in addressing issues of gender inequality in digital technology. Instilling gender equality and eliminating bias within the family unit serves as a crucial foundation. By fostering such beliefs from an early age, the perception of digital technology as a male-dominated domain can be reduced. Furthermore, the active involvement of organisations in promoting gender equality and opportunities for women in STEM, ICT, or digital technology is key.

At the same time, robust legal frameworks must be put in place at the national level to support and protect girls and women from discrimination, sexual harassment, abuse, and violence in public spaces, schools, workplaces, and online environments. While addressing elements of exclusion at a formal level, it is also necessary that this takes place informally – at the individual level. Indeed, individual responsibility plays a key role in realising an inclusive digital economy. In this rapidly evolving digital landscape, proactively seeking information, staying informed about technological advances, and continuously improving digital literacy are essential steps towards personal empowerment. By taking charge of their own digital experiences, individuals can not only improve their own prospects but also contribute to the broader goal of inclusive digital economy.

The private sector also plays a pivotal role in addressing elements of exclusion – in particular in upgrading and upskilling digital skills and knowledge of their staffs. With their knowledge and expertise in specific areas, they can raise awareness of the benefit of digital technology for sales and marketing, for instance. Figure 3 illustrates the multiple levels involved in addressing an inclusive digital economy.

Figure 3: Multiple Levels in Addressing an Inclusive Digital Economy



Source: UNDESA (2009).

Addressing an inclusive digital economy in the regional level will go hand in hand with the efforts to address inclusive digital economy at the national level, which require multiple levels of involvement as shown in Figure 3.

5. Internet across the ASEAN Region

Access to broadband internet³ is a necessity in the digital world. It serves as a gateway to economic activities, education, health, and employment opportunities and enhances social connectivity. Access to broadband internet in the ASEAN region remains unequally distributed, because infrastructure development is determined by population density, economic

³ Broadband denotes a high-bandwidth internet connection that uses thicker cables to provide a faster connection (Kim, 2023). A broadband connection is characterised by high speed, high bandwidth, and low latency, facilitating access to a wide range of online services such as video conferencing, e-education, online gaming, e-commerce, e-health, e-government, video streaming, and cloud computing. In addition, a broadband connection enables voice over internet protocol (VoIP), which allows voice calls to be made over an internet connection, and internet protocol television (IPTV), which allows video content to be delivered over an internet connection rather than traditional analogue television cables.

activity, and geographical location. The distribution of broadband infrastructure tends to be concentrated in economically viable urban areas, where the population density is higher and the potential for return on investment is greater.

In the pre-internet era, AMS ensured universal access to postal and fixed-line telecommunications services in rural, remote, and outermost areas. This initiative, known as the Universal Service Obligation (USO), led telecommunications operators to subsidise infrastructure development and investment in high-cost or low-revenue market segments by using profits from high-value segments. Initially, the USO focussed on analogue/fixed telephone services. However, with the subsequent emergence of mobile telephones, decline of fixed voice telephones, and rise of the internet, USO policy evolved to encompass broader connectivity objectives. Today, countries around the world – including AMS – have extended their USO policies to include internet services. This strategic approach has enabled people living in such areas to benefit from both voice and data services.

Additionally, to address the need for infrastructure development, many countries have established the Universal Service Provision Fund to help finance infrastructure in underserved rural, remote, and ultra-remote areas. This approach is relatively cost-effective for extending services, especially given the significant costs associated with service deployment and limited return on investment. As technology has evolved, the fund has expanded to include broadband internet services. In the ASEAN region, Malaysia pioneered the inclusion of broadband in the Universal Service Provision Fund in 2008, followed by Indonesia in 2010 and Thailand in 2012 (Wismadi and Ifthikar, 2019). Cambodia and Myanmar are the most recent participants in ASEAN, both of which aim to increase support for broadband internet access (Wismadi and Ifthikar, 2019).

The most common technologies used to deliver broadband internet services include cable, fibre, DSL, fixed wireless, and satellite (Kim, 2023). Each technology has its strengths and weaknesses. For example, satellite is primarily used to provide services to rural and remote areas where challenging geographical topology makes the use of fibre and cable technology impractical. Satellite-based internet services, however, have higher latency and slower speeds. As nearly half of the ASEAN population resides in rural areas, ensuring high-quality internet services for this segment is key to promoting an inclusive digital economy.

Providing affordable, high speed and reliable broadband internet access remains a challenge for many AMS. In the digital economy era, countries that with affordable high speed broadband internet access will be able to benefit more from the opportunities presented by the advanced digital technologies. It is therefore, addressing inclusive digital economy necessitates

addressing connectivity issues and understanding specific segments of the population needs and demands on data/internet access.

Challenges of Broadband Connectivity

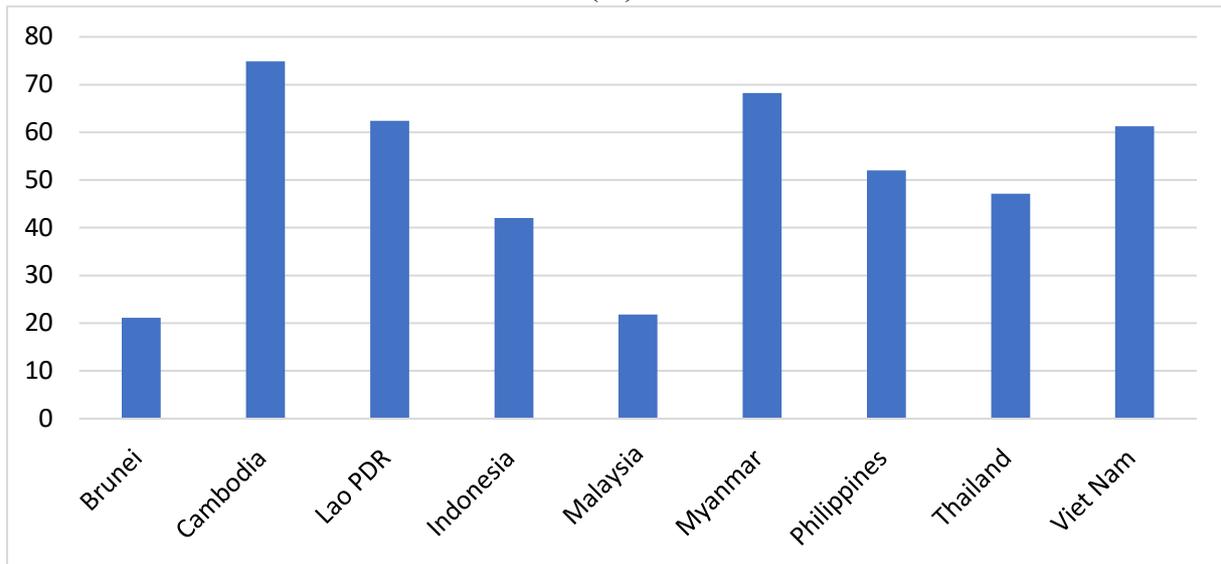
Connectivity remains a persistent challenge in narrowing the digital divide, particularly in ASEAN, where a significant proportion of the population lives in rural areas. Initially, the focus of internet connectivity was on providing access to bridge the digital divide between urban and rural areas. In the era of broadband internet, simply providing access is not enough to address the complexities of inclusive digital economy. Issues of affordability and quality help widen the digital divide. Limited access to broadband internet services further hampers rural populations' access to the internet. In addition, rural areas face multiple challenges, including slow infrastructure development, limited job opportunities, sparse public services, and inadequate educational resources. Geographically disadvantaged by their location and smaller populations, rural areas are often seen as unattractive for economic investment.

Although ICT services are becoming more affordable, these services are still financially out of reach for the poorest 40% of the population (ITU, 2022a). This gap is particularly pronounced between urban and rural areas, reflecting differences in income levels. Addressing affordability issues, therefore, requires tackling income inequalities. Critical to this effort is the creation of economic opportunities in rural areas that would raise the income levels of their inhabitants. Without targeted policy interventions, rural areas risk perpetually lagging behind their urban counterparts.

However, geographical factors contribute significantly to the unattractiveness of rural areas for economic opportunities and investment, with a direct impact on income levels. Urban areas in many countries benefit from economies of scale and proximity to markets (ERIA, 2022). Rural areas do have dispersal forces stemming from locational advantages such as lower labour costs and land prices. Balancing these opposing forces is key to bridging the income gap between urban and rural areas. For example, policymakers can enhance the locational advantages of rural areas through the development of industrial estates that create employment opportunities in areas such as food processing, cottage industries, and software outsourcing (ERIA, 2022). This approach requires an understanding of local demographics, education levels, and skills, however, to ensure that such development benefits the local population rather than drawing skilled labour away from urban centres and further marginalising the rural population.

Addressing inclusiveness issues in rural areas is crucial, considering the significant portion of the ASEAN population residing in such areas. Cambodia has the biggest rural population in ASEAN at 74.89%, followed by Lao PDR at 62.41%, Viet Nam at 61.23% and the Philippines at 52.02% (Figure 4).

Figure 4: Share of Rural Population in ASEAN, 2022
(%)



Lao PDR = Lao People’s Democratic Republic.

Note: Singapore does not appear in the figure as it has no rural areas.

Source: Statista (2022d).

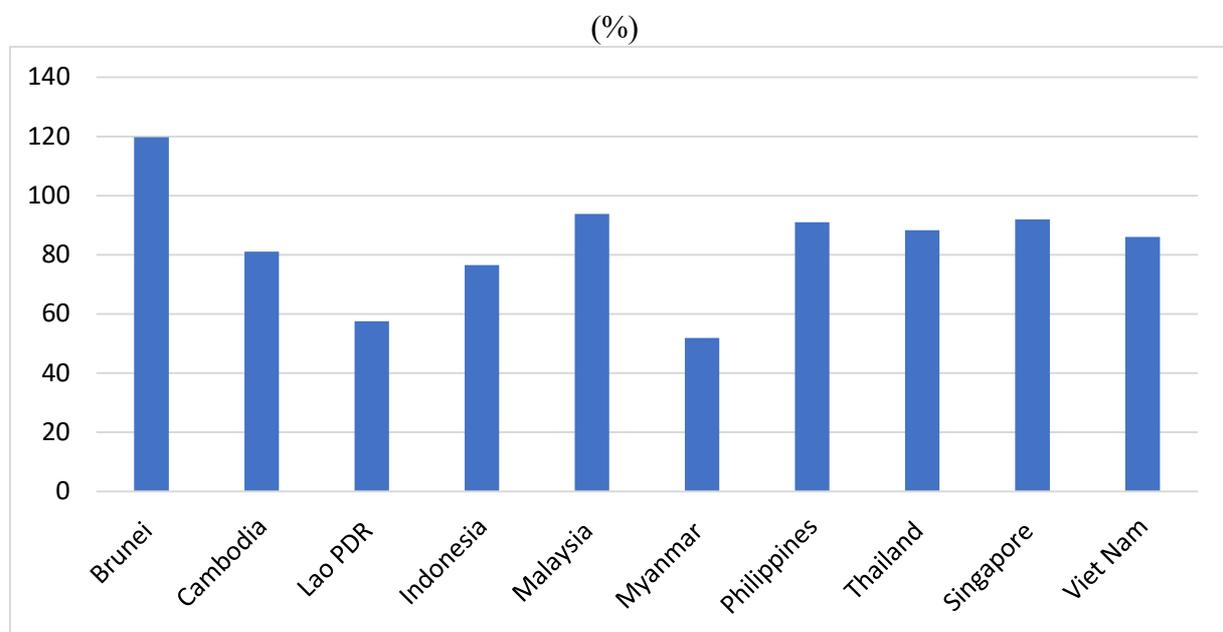
There are two different ways to extend broadband internet service to rural areas: (i) through universal access, where the population of a rural village can access broadband through community facilities such as local telecentres; and (ii) universal service, where every member of a village has individual or household broadband access (ASEAN, 2021a).

The first path is more feasible to implement than the second (ASEAN, 2021a). During the pandemic, for instance, telecentres supported students’ online learning by not only providing internet access but also the necessary physical means such as personal computers (PCs). Yet essential demographic data on rural areas – comprising age groups, educational achievements, and employment status – form the foundational understanding required to establish such telecentres and facilitate evidence-based policymaking. When planning initiatives such as setting up telecentres to support online learning, policymakers need a solid information base. The demographic data acts as evidence, providing a clear understanding of the needs and characteristics of the population in these areas. For example, if the data shows that a significant proportion of schoolchildren do not have personal computers, policymakers

can strategically allocate resources to provide the necessary infrastructure in telecentres and ensure that they are equipped with personal computers. This evidence-based approach ensures that policies are not only well-informed, but also tailored to the specific needs of the population. It avoids a one-size-fits-all approach and instead allows for targeted interventions. In this case, having demographic data would help policymakers make decisions that are more likely to effectively address the challenges faced by the rural population, particularly in the context of supporting online learning during the pandemic.

Aside from rural connectivity challenges, the internet penetration rate in ASEAN is far from universal. Some AMS are still striving to attain a 90% mobile internet penetration rate; data show that internet penetration peaks in Brunei Darussalam at over 119.7%, while Viet Nam lags behind at 86.0% Cambodia at 81.1%, Lao PDR at only 57.5% (Figure 5).

Figure 5: Internet Penetration Rate in ASEAN, 2022



Lao PDR = Lao People’s Democratic Republic.

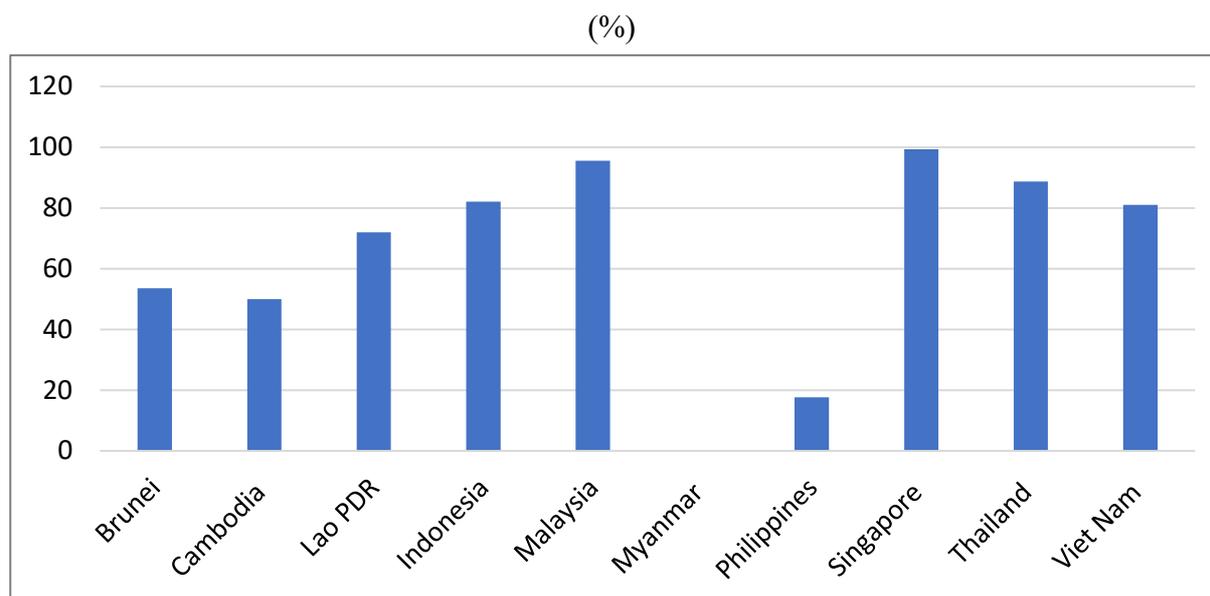
Note: The figure exceeds 100% because the calculation is based on the number of subscriptions rather than individual users.

Source: Statista (2022a).

The penetration rate of fixed internet connections or home internet access amongst AMS reveals a worrying reality. The Philippines has a fixed internet penetration rate of only 17.7%, while Lao PDR and Cambodia have rates of 50.0% and 72.0%, respectively. Although Brunei Darussalam has the highest mobile internet penetration rate in ASEAN, its fixed internet

penetration rate lags behind at 53.6%, placing it in the bottom three.⁴ Figure 6 shows the share of the population with internet at home or a fixed internet connection.

Figure 6: Share of the ASEAN Population with Internet at Home in 2021



Lao PDR = Lao People’s Democratic Republic.

Note: Data from Myanmar are unavailable.

Source: Statista (2021b).

Data on internet penetration rates, mobile or fixed, are not differentiated according to the geographical location of subscribers. This makes it difficult to measure the percentage of internet penetration in rural areas across the ASEAN region. Multiple studies have acknowledged a digital divide between densely populated cities and rural areas; however, it is difficult to understand the extent of the digital divide, however, without data on the internet penetration rate and internet speed in rural areas.

The majority of cities in ASEAN are connected to broadband internet – but mostly to mobile internet. While mobile broadband internet access is affordable in most AMS, it cannot match the quality of fixed broadband internet access. Unlike fixed internet connectivity, mobile internet connectivity is more unreliable due to factors such as the location of internet access, network traffic, weather conditions, and limited data plans. Furthermore, mobile broadband cannot meet the demand for high data usage – such as Zoom meetings and online educational

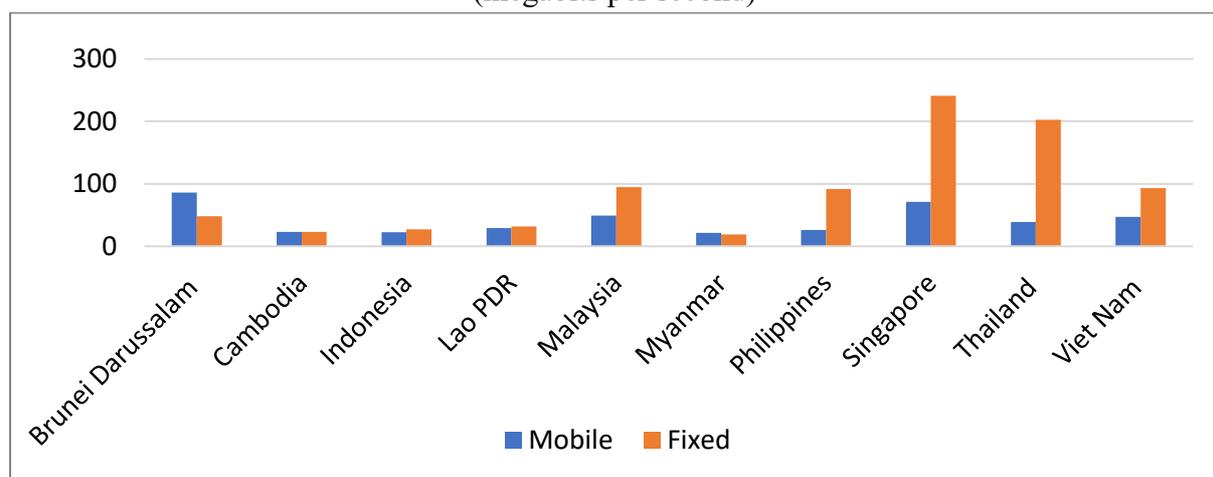
⁴ Notably, Brunei Darussalam has made progress in transitioning to 5G mobile internet network services and is on the verge of fully deploying this technology. Given its commitment to deploying 5G services and the fact that it already has the highest mobile internet penetration rate in ASEAN, the availability of internet at home may not be a major concern, as the need for high-quality internet connectivity is being met.

content – which consume significant amounts of data.⁵ Its speed is often limited to the data plan purchased; once customers nearly achieve their data plan quotas, the speed becomes much slower, affecting the time to download large content. A fixed broadband connection, however, offers much higher speeds and lower latency. Multiple data show that the fixed broadband internet penetration rate remains low in most AMS, indicating a slow uptake in the region.

Internet speed also remains a challenge for many AMS. Data have shown that the average upload and download speeds for fixed broadband are three to five times higher in high-income countries than in low- and lower-middle-income countries, with mobile broadband also around three times faster (UNESCAP, 2020). Some research has suggested that fixed broadband internet speeds in many AMS still lag behind those of developed countries, despite the high number of internet subscribers in the region.

The average mobile internet speed in Brunei Darussalam is 85.78 megabits per second (Mbps), while in Singapore it is 71.1 (Figure 7). In Indonesia – home to 204.7 million internet users as of January 2022 – mobile broadband internet speed is 22.33 Mbps, lower than Cambodia’s 22.79. Data show significant differences between mobile and fixed broadband internet speeds in Singapore, Thailand, Malaysia, Viet Nam, and the Philippines as well. The differences are relatively small in the remaining countries.

Figure 7: Median Internet Speed in ASEAN Member States, May 2023
(megabits per second)



Lao PDR = Lao People’s Democratic Republic
Source: Ookla (2023).

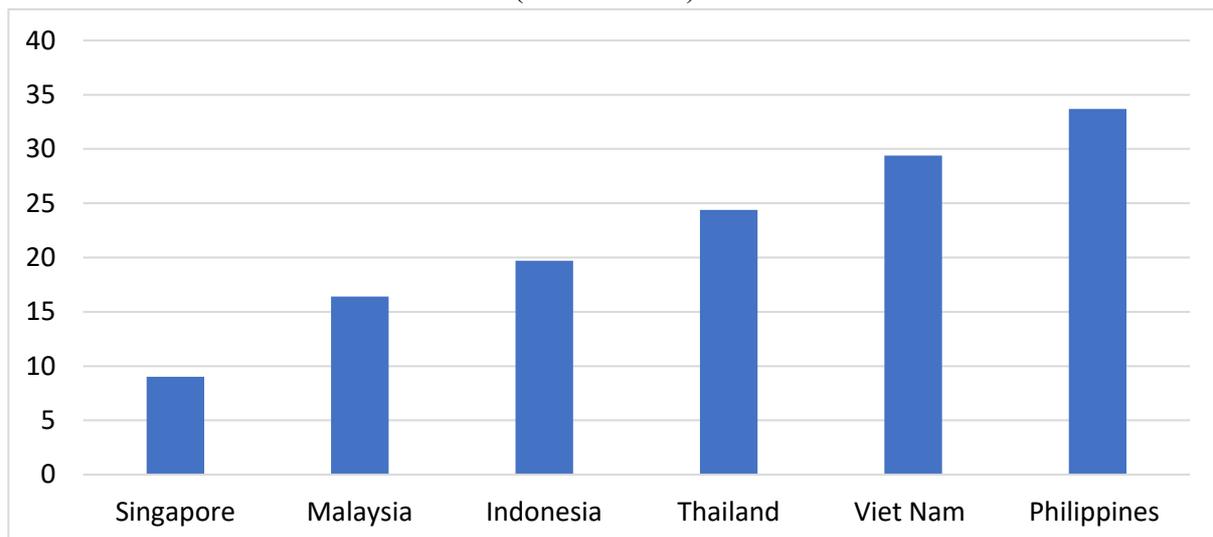
⁵ To illustrate, to support good quality simultaneous videoconferencing for a family of four, an internet speed of around 100 Mbps for download and 35 Mbps for upload is essential, while a single person needs a minimum download speed of 25 Mbps and upload speed of at least 5 Mbps (Broadband Commission for Sustainable Development, 2022).

Brunei Darussalam is a notable case where mobile broadband internet speed exceeds fixed broadband internet speed, securing the top position in ASEAN. This achievement can be attributed to the country’s advancement in mobile broadband technology and its readiness to transition to 5G connectivity.⁶

High-speed internet enables people to experience new digital services, applications, and transformative technologies such as internet of things, artificial intelligence, and cloud-based services. In essence, a high-speed internet connection acts as a catalyst, pushing a country to develop its digital economy and enabling its population to reap the full benefits of the digital economy. However, aside from the availability of the service, the subscription price factors into a low broadband penetration rate. If these challenges – which encompass not only internet speed but also the availability and affordability – are not addressed, the divide amongst AMS will widen further in the near future.

Data also show that mobile latency⁷ in some AMS is still high. Singapore has the lowest mobile latency at 9.0 milliseconds, followed by Malaysia and Indonesia at 16.4 and 19.7 milliseconds, respectively. In contrast, the Philippines has a latency of 33.7 milliseconds (Figure 8).

Figure 8: Median Mobile Latency in Common Coverage Areas in ASEAN-6 (milliseconds)



Source: Statista (2021).

⁶ UNN, Brunei Telecommunications Industry Initiate Fixed Broadband Uplift to Improve Customer Digital (Online) Experience, <https://unn.com.bn/index.php/brunei-telecommunications-industry-initiate-fixed-broadband-uplift-to-improve-customer-digital-online-experience>

⁷ Latency refers to the amount of time taken for data to travel to devices. The higher the latency, the slower the amount of time taken to download data (e.g. a webpage).

With increased data demands, ensuring high-speed connections coupled with low latency has become critical. This not only improves the customer experience but also unlocks the full potential of digital technologies, delivering significant benefits.⁸ Latency below 300 milliseconds is essential to ensure consistent and coherent conversations during activities such as web browsing, video streaming, and voice calls (Ookla, 2023). Latency also plays a critical role in determining page load times. For example, a latency of 500 milliseconds can lead to a sevenfold increase in the time it takes to load a full web page, even on a gigabit connection (Ookla, 2023).

Mobile network technologies have continued to evolve, progressing from 2G to 3G, then to 4G/LTE, and currently witnessing the emergence of 5G networks in some countries. The emergence of 5G technology may indeed help internet speed. With 5G technology, customers can benefit from 50-times faster internet speeds and 10-times higher responsiveness with low latency and low power connectivity (AT Kearney, 2019). Thus, 5G network services can unlock opportunities for individuals and businesses to take full advantage of digital technologies. Recognising this transformative potential, several AMS have started to roll out 5G networks. A successful example is Thailand, where the 5G network services rollout reached 76% of the total population by the end of 2021 (Chan, 2022). Singapore has achieved rollout of 95% (Raj, 2022). Other AMS are also implementing 5G to varying degrees.

Despite the introduction of the 5G network, older technologies still persist in some AMS. In Indonesia, Telkomsel has phased out 3G services to pave the way for the introduction of 4G networks, while other operators are also planning to shut down 3G networks, although no specific target dates have been set. Meanwhile, Cambodia, Malaysia, the Philippines, and Singapore are planning to gradually shut down 3G networks, while Brunei Darussalam is planning to shut down 2G, and Thailand and Viet Nam are planning to discontinue their 2G network services. The shutdown of 2G and 3G networks will make way for the introduction of 4G/LTE services, which will ensure the transition to 5G services at a later stage.

However, the 5G network may present some challenges. First, to take full advantage of the service, users' mobile phones must be compatible with 4G and/or 5G. The cost of a 5G compatible mobile phone can be prohibitive, especially for those with lower incomes. To address this concern, some AMS have introduced subsidies to help users upgrade to 4G/5G-compatible devices. In Viet Nam, for example, the government plans to provide 2.1 million

⁸ Every 100 milliseconds of additional latency on Amazon.com cost the company 1% of revenue (Ookla, 2023).

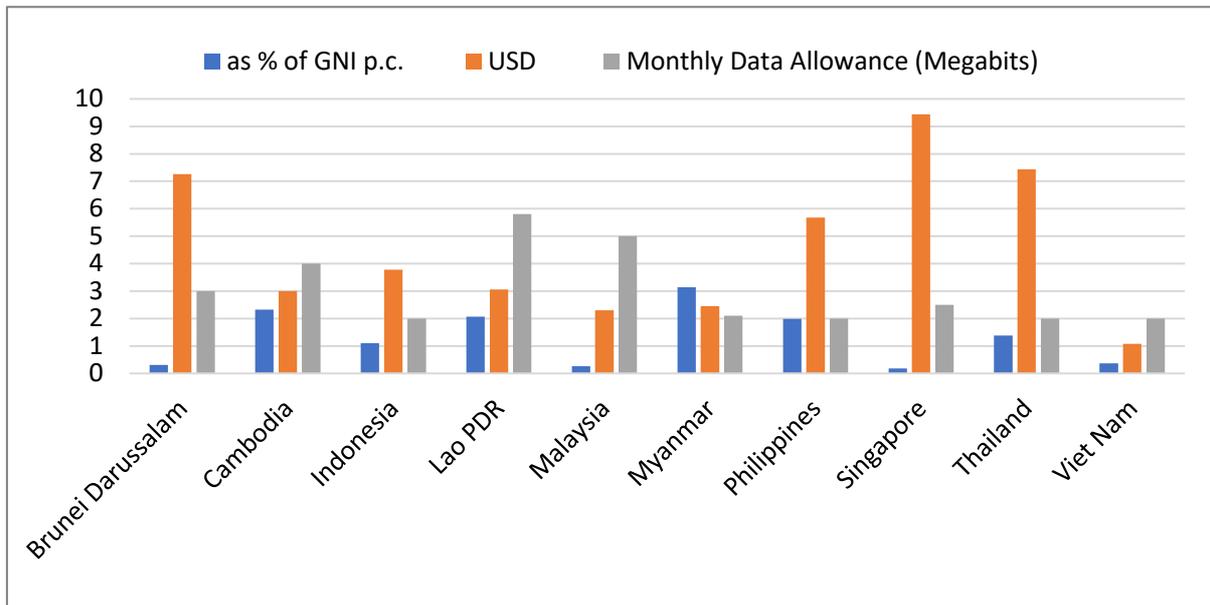
smartphones nationwide to poor and near-poor households to enable access to 4G/5G technologies (Nguyen, 2021). In the Philippines, one operator, Smart, plans to subsidise part of the cost for 3G subscribers to upgrade to 4G handsets that will allow them to stay connected after 3G services are shut down (Rosales, 2023).

5G services also face the challenge of high subscription prices, which will impact users' affordability, especially low-income groups. While 5G promises a vastly improved user experience, some individuals may be reluctant to pay premium prices for the services or find them financially unattainable. This has the potential to widen the gap between income groups and sexes. Ensuring the affordability of emerging technologies, such as 5G network services, is critical to maintaining the inclusiveness of broadband internet access. Collaboration between governments, regulators, mobile operators and other stakeholders is, therefore, essential to build a robust and inclusive 5G ecosystem that benefits all individuals and the economy.

Affordability of broadband internet services is typically measured in terms of average gross national income (GNI) per capita. However, what is considered affordable for the average earner within a country may not be affordable for the entire population due to existing income disparities (ITU, 2022a). A useful indicator for understanding the barriers to broadband internet affordability for universal connectivity is the price of broadband services relative to the income level of the poorest 40% of the population, as mentioned previously (ITU, 2022a). It is therefore necessary to obtain data on the income levels of the poorest 40% in each country to enable regulators and policymakers to formulate well-informed policies and regulations.

Based on average income levels in ASEAN, Singapore's data-only mobile broadband price is the highest (\$9.44). However, when measured as a percentage of GNI per capita, it is the cheapest in the region at just 0.18%. Malaysia (0.26%), Brunei Darussalam (0.31%), and Viet Nam (0.37%) are the next most affordable countries for data-only mobile broadband. Myanmar (3.14%), Cambodia (2.32%), Lao PDR (2.06%), and the Philippines (1.98%) are the AMS with the highest data-only mobile broadband prices (Figure 9). Lao PDR offers a data allowance of 5.8 Mbps, second only to Malaysia, which offers 5.0 Mbps.

Figure 9: ASEAN Data-Only Mobile-Broadband Speed Basket (2-Gigabyte), 2022
(%)



GNI = gross national income, Lao PDR = Lao People’s Democratic Republic, USD = United States dollar.
Notes:

1. The data are based on a major operator in each country.
2. The data are based on a measurement of 2 gigabytes (GB) of data usage per month for mobile broadband internet. It is important to note that during the pandemic, there was a sharp increase in data demand for mobile broadband internet access, and the 2-GB measurement fell short of needs of individuals. The average mobile data demand per smartphone worldwide has been growing steadily, reaching 11 GB per user in 2021. This significant increase in mobile data demand raises questions about the relevance of using 2 GB as a standard benchmark, as it may no longer accurately capture prevailing usage patterns and affordability considerations.

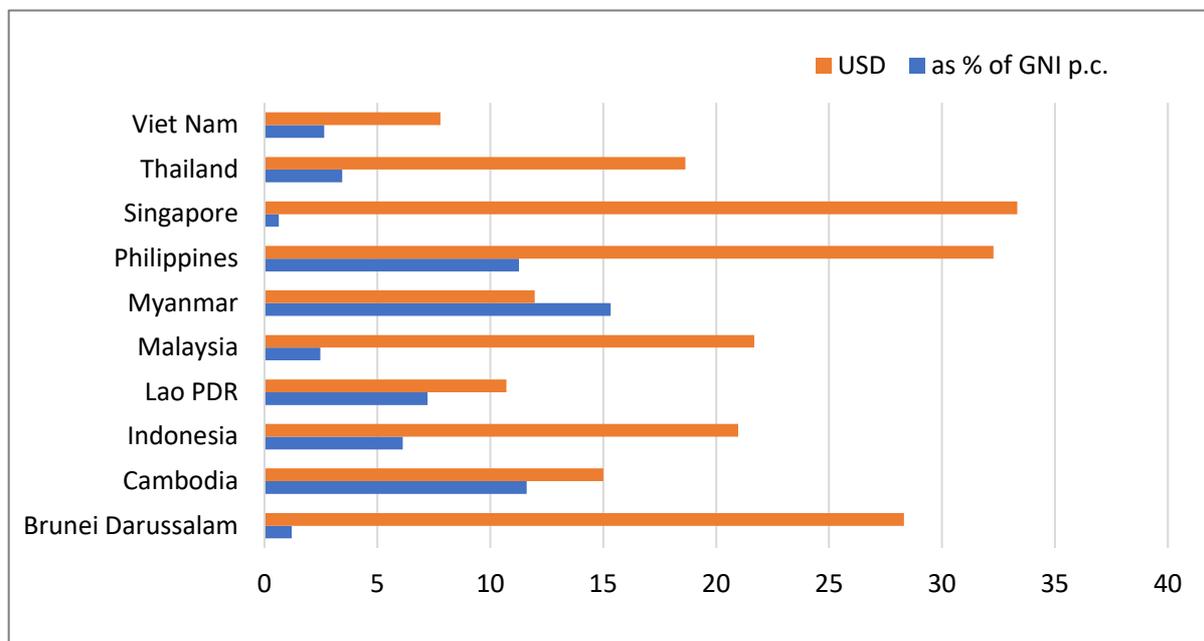
Source: ITU (2022); Broadband Commission for Sustainable Development, 2022.

ITU set \$2 as a ceiling for internet affordability. Under this principle, the internet is not affordable by many in Cambodia, Lao PDR, and Myanmar. This may hinder these AMS in reaping the benefits of the digital economy, placing them behind other AMS and widening the digital divide within the region. While addressing this issue is must be carried out at the national level, ASEAN can serve as a platform of collaboration, exchange of best practices, and expertise.

Demand for mobile data is also projected to continue its upward trajectory, tripling by 2027, driven primarily by the widespread adoption of 5G technologies (Broadband Commission for Sustainable Development, 2022). Against this backdrop, there is an urgent need to re-evaluate and adapt measurement standards to the evolving trends in mobile data consumption in ASEAN, especially because growth of the digital economy will significantly increase the demands on data. This adaptation is essential to ensure that broadband internet remains not only accessible – but also affordable – to all.

As mentioned previously, fixed broadband internet offers a faster, more reliable connection – but this remains inaccessible for some groups in the ASEAN region. Affordability continues to be an obstacle in increasing the broadband penetration rate. For example, Indonesia's fixed broadband penetration rate was 18% in 2022, in stark contrast to Singapore's 110% (ATKearney, 2023). Looking at fixed broadband prices as a percentage of GNI per capita underlines these differences. Indonesia's fixed broadband costs represent 6.13% of its GNI per capita, while the figure is much lower in Singapore (0.64%) and Brunei Darussalam (1.20%). In Viet Nam, the price of a fixed broadband subscription is 2.64% of GNI per capita. Comparatively, Myanmar has the highest fixed broadband costs at 15.33% of its GNI per capita, followed by Cambodia at 11.61% and the Philippines at 11.26% (Figure 10).

Figure 10: Affordability of Fixed Broadband Connectivity in 2022, 5 GB
(based on % of gross national income per capita)



GNI = gross national income, Lao PDR = Lao People's Democratic Republic, USD = United States dollar. Source: ITU (2022b).

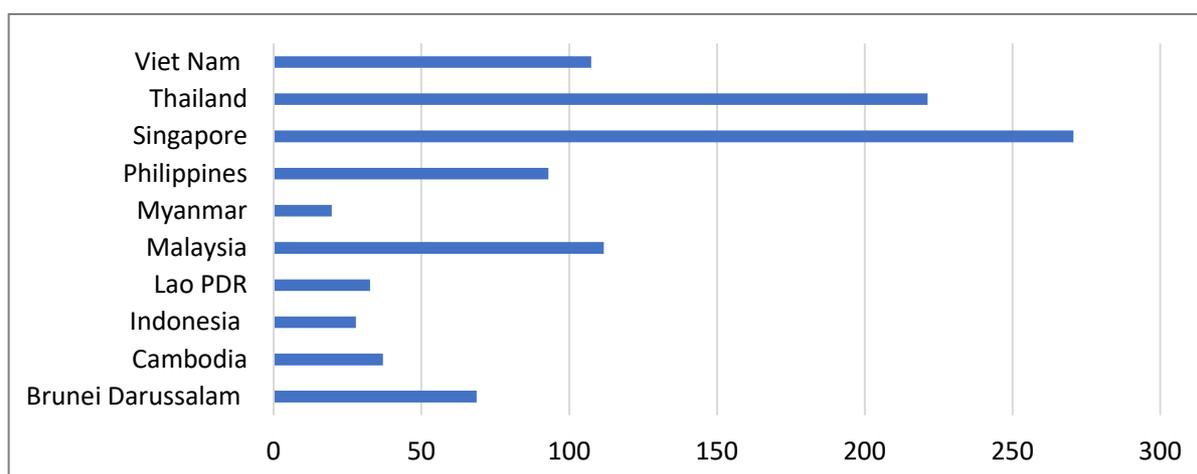
Figure 10 illustrates the price divide in fixed broadband internet access across AMS. There are two main reasons for this divide. First, income disparities resulting from different levels of development limit the purchasing power of individuals, making fixed broadband internet access less affordable for many. This is evident in the global trend, where the relative price of fixed broadband services increased from 2.9% of GNI per capita in 2020 to 3.5% in

2021 (ITU, 2022b). Similarly, the relative price of mobile broadband services also increased globally, reaching 2.0% of GNI per capita, up from 1.9% the previous year (ITU, 2022b).

Second, regulatory factors play a significant role, including limited competition in the broadband value chain, challenges related to rights of way and permits, spectrum allocation, licensing restrictions, and other barriers such as number portability (World Bank, 2019). As the demand for data is set to increase significantly, access to high-quality, reliable, and affordable fixed broadband internet is emerging as a critical enabler for the success of the digital economy, empowering individuals and businesses alike. Investments in 4G/LTE for mobile internet and fibre access networks for fixed broadband are essential to remain competitive and to take advantage of other digital technologies (World Bank, 2019).

Singapore stands out as the global leader in fixed broadband speed, boasting a median download speed of 270.62 Mbps. In contrast, Myanmar ranks significantly lower at 141st place with a speed of 19.68Mbps, and Indonesia at 126th place with 27.87 Mbps (Figure 11). Cambodia levelled 19 up from 129th to 111st place within a year (Ookla, 2023). This slow fixed broadband internet speed is particularly worrisome for Indonesia, a country with a burgeoning, tech-savvy, youthful population. Indonesia's rapid growth in the digital economy, driven by its swift transition to digital finance and e-payment systems, amplifies the significance of the issue. The current internet speed challenges both businesses and individuals in fully harnessing the potential of the digital economy.

Figure 11: Fixed Broadband Internet Speed across ASEAN, December 2023
(Megabits per second)



Lao PDR = Lao People's Democratic Republic.
Source: Ookla (2023).

It is clear that addressing both the availability and affordability of broadband internet access requires the active involvement of a wide range of stakeholders. The creation of an enabling environment through well-structured regulatory frameworks that promote infrastructure development, infrastructure sharing, spectrum allocation, and licensing as well as ensure fair competition will encourage widespread access to broadband internet connectivity. At the same time, addressing income inequalities is an important aspect of ensuring that the benefits of digitalisation are accessible to all segments of society. The provision of affordable and accessible fixed broadband internet for all has the potential not only to bridge the digital divide but also to open up new avenues for growth in the digital economy. This comprehensive approach – encompassing technology readiness, inclusive policies, and collaborative efforts – is essential to steer ASEAN towards a digitally inclusive and prosperous future.

Addressing connectivity issues also necessitates an understanding of specific segments of the population. Aside from rural areas, the discussion needs to further elaborate on, for example, MSME affordability and their needs of high-speed internet access to engage in the digital economy.

6. Digital Financial Services

Financial inclusion means that all segments of a population – including those with the lowest incomes – have access to formal financial products and services (ADB, Oliver Wyman, MicroSave, 2017). For the purposes of this paper, digital financial inclusion is defined as (i) provision of financial services designed to reach the underserved and financially excluded by providing access to a wide range of financial services through digital means, and (ii) attempts to increase the digital financial literacy of the underserved and financially excluded to enable them to make informed financial decisions. Providing financial services to the financially excluded in the ASEAN region is paramount, as the unbanked population accounts for over 60% of the entire population; a significant proportion of informal workers also face inadequate financial access (Lim, 2022). The ongoing process of digitalisation is compounding the difficulties faced by informal workers and other marginalised groups, further necessitating internet connectivity and digital literacy to effectively engage them with digital financial services.

Providing basic financial services remains a significant barrier to achieving financial inclusion. This challenge is partly attributed to the complex process of identifying individuals,

as financial service providers abide by their country's 'know your customer' (KYC) policy. The KYC policy requires individuals to provide verified personal identification. However, meeting this requirement can often be difficult, especially in cases where the country is still in the process of integrating personal data into a national digital system. For example, in Indonesia, a verified personal identification refers to an electronic personal identification card (ID) known as an e-KTP. However, during the transition period, many people did not receive their e-KTPs, which prevented them from accessing basic financial services. To address this challenge, Indonesia simplified its KYC processing policy by allowing individuals to submit a letter from a district official confirming the validity of their old ID.⁹

A successful example of an inclusive financial service is Laku Pandai, branchless financial services in Indonesia launched as part of the National Strategy for Inclusive Finance in 2012. Laku Pandai, a collaboration between Otoritas Jasa Keuangan and financial service providers, has effectively integrated the underserved, unbanked, and even micro enterprises into the financial system.¹⁰ It has enabled Indonesia to integrate a wider segment of the population – regardless of their geographical location – into digital banking services.

Promoting the inclusion of unbanked and underserved populations is key to advancing inclusive digital financial services. In the digital age, extending financial services to these segments means more than simply enabling active bank accounts; it also denotes increasing digital financial literacy. Currently, ASEAN is benefiting from the rapid expansion of the digital financial system, facilitated by enabling frameworks for payment regulations, widespread adoption of e-money, and regulations that allow the use of agents by both banks and non-bank entities (World Bank and ASEAN, 2019). As the digital financial system has experienced significant growth over the past decade with advancements in regulations, products, services, and market participants, digital financial literacy is critical to enable individuals and businesses to use digital financial services and to understand their associated rights and responsibilities (AFI and ASEAN WC-FINC, 2021).

However, while this growth presents opportunities, it also presents challenges in terms of inclusivity, given the significant number of unbanked individuals who still exist in the

⁹ Although most AMS have well-developed national ID systems, which facilitates access to basic financial services, it is imperative to periodically review KYC-processing policies, with particular attention given to the inclusion of informal workers, individuals living in rural and remote areas, persons with disabilities, and MSMEs within the scope of basic and digital financial systems.

¹⁰ OJK, Laku Pandai, <https://www.ojk.go.id/id/Pages/Laku-Pandai.aspx#:~:text=%E2%80%8B%E2%80%8B%E2%80%8BLaku%20Pandai,dengan%20penggunaan%20sarana%20teknologi%20informasi>

region. Building an inclusive digital financial system is critical in fostering an inclusive digital economy. A requirement is to identify the unbanked segments of the population and to gain a comprehensive understanding of the barriers that they face. Data that profile the characteristics of the unbanked population, such as type of employment (formal or informal), income levels, geographic location, and sex, are critical to highlighting gaps in digital financial services in ASEAN. Once identified, targeted policies can be formulated to bridge these gaps.

To adapt to the evolution of digital financial services, the majority of AMS have established national financial inclusive strategies. Indonesia, for example, launched its strategy in 2012, covering key aspects such as basic financial services and consumer protection. As a step towards improving financial literacy, Indonesia is set to release a national financial literacy strategy. Viet Nam is finalising its national financial inclusive strategy. Singapore, Malaysia, Thailand, and Brunei Darussalam have achieved near-universal financial inclusion (Loon Loo, 2019). Singapore has moved beyond an inclusive financial strategy to a Smart Nation strategy that is based on the pillars of a digital society, digital economy, and digital government. Although its focus has shifted to financial technology (FinTech) initiatives that aim to make it a leading digital financial hub, Singapore continues to promote financial literacy through MoneySense, a national financial education programme created in 2003, co-led by the Monetary Authority of Singapore and the Ministry of Manpower (*The FinTech Times*, 2022).

Table 1 provides an overview of the inclusive financial policies implemented across AMS, highlighting the aspects covered by these policies.

Table 1: Inclusive Financial Policy in ASEAN

Policy	Brunei	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Thailand	Viet Nam
National inclusive financial policy	√	√	√	√	√	√	√	√	√
Basic financial services (savings, transfer, credit, insurance)		√	√	√	√	√	√	√	√
MSMEs	√	√	√		√		√	√	√
Gender		√	√	√		√	√		√
Financial literacy	√	√	√	√	√		√	√	
Consumer protection	√	√	√	√	√		√	√	√
Digital financial services	√	√	√	√	√	√	√	√	√
Capacity building programmes	√	√	√	√	√	√	√	√	√

Lao PDR = Lao People's Democratic Republic; MSMEs = micro, small, and medium-sized enterprises.

Source: Author.

AMS are working towards achieving the goals set out in their respective national financial inclusion strategies, often in collaboration with international partners. However, with the rapid expansion of digital financial services and the subsequent rise of FinTech, these strategies must be reassessed to ensure that they are in line with evolving market dynamics and the needs of specific target populations. To this end, it is essential to understand which specific population groups need to be integrated into these strategies; data on the characteristics of each group must be available to support this understanding. Once this identification process is completed, target-oriented policy approaches can be designed to address the unique needs of these specific groups.

FinTech in the ASEAN market continues to grow, a trend that has been further accentuated by the pandemic. There was a 33% increase in investment in the South-East Asian FinTech market from \$190 million in 2015 to \$252 million the following year (World Bank, 2019). In 2017, the FinTech market in the region was dominated by e-payments and mobile wallets, which accounted for 43% of the sector, followed by financial comparison platforms at 15% and retail investment portals at 11% (World Bank, 2019). In the first 9 months of 2021, the ASEAN FinTech sector was valued at \$3.5 billion (UOB, 2021). The following year, FinTech firms recorded \$4.3 billion within the first 9 months, higher than the total from 2018 to 2020 combined (UOB, 2022). Of the \$63.5 billion of investment in the region, 7% went to FinTech, up from 2% in 2018 (UOB, 2022).

The FinTech industry is integral to fostering an inclusive digital economy, as it provides avenues to integrate a wider range of customers. FinTech opens opportunities for the unbanked to have access to multiple financial services, like deposits, money transfers, and loans. It also provides more opportunities for MSMEs for credits and loans, under more simple requirements than conventional banks. Access to digital finance offers opportunities for MSMEs, particularly micro and small enterprises, to participate in the digital economy. The presence of FinTech is also able to address inclusive digital financial services to varying degrees.

However, the focus of the FinTech industry is primarily on the ASEAN-6 countries, resulting in a widening gap with the remaining AMS. AMS with more advanced digital financial systems have established dedicated supervisory bodies to facilitate the flow of information to and to supervise FinTech, with regulatory sandboxes as the most common methodology.¹¹ By setting up regulatory sandboxes, ASEAN-6 countries have established

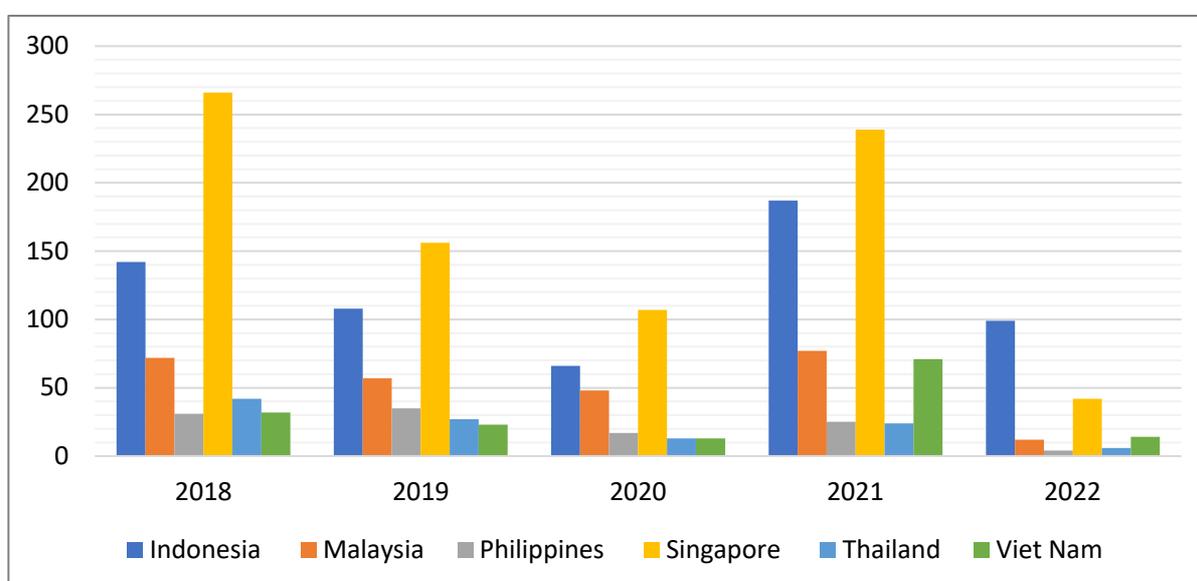
¹¹ Regulatory sandboxes allow small-scale live testing of innovative products in a controlled environment under the supervision of the regulator, while providing the opportunity for regulators to revise the regulatory and supervisory framework (World Bank and ASEAN, 2019).

supportive environments for the growth of FinTech companies, which in the end promotes the growth of FinTech industry.

Currently, the distribution of FinTech funding within ASEAN is dominated by Singapore and Indonesia. Singapore has the largest share, accounting for 43% of total FinTech funding in ASEAN, while Indonesia follows closely with a 33% share (UOB, 2022). In 2018 alone, Singapore was home to 266 FinTech companies, while Indonesia had 142 (UOB, 2022).¹²

Although e-payments continue to dominate FinTech funding, a significant proportion of new companies are coming from gaming and NFT¹³ companies, reflecting the increasing investment in developing and monetising the metaverse ecosystem (UOB, 2022). Although the growth of FinTech only started in the recent years, monitoring its trend must be a part of inclusive digital finance efforts. Figure 12 shows the growth of FinTech in ASEAN-6.

Figure 12: FinTech Companies in ASEAN-6



Source: UOB (2022).

Going forwards, inclusive digital finance in ASEAN requires recognising and addressing the differences between AMS with more advanced digital financial systems and those that are still strengthening their financial infrastructure. Facilitating the sharing of best practices is a way to promote collaborative initiatives. Furthermore, partnerships with international

¹² The number of FinTech companies entering the market declined in 2019 and 2020, pandemic years (UOB, 2022). In 2022, the number of FinTech companies entering the market reached an all-time low of 127 companies across ASEAN-6 (UOB, 2022).

¹³ Non-fungible token.

organisations may help AMS with less developed financial systems so that they, too, can desirable homes to FinTech companies.

A key challenge relates to regulatory oversight, particularly with respect to consumer protection and data governance (ADB, Oliver Wyman, MicroSave, 2017). In Indonesia, Malaysia, the Philippines, Singapore, and Thailand, multiple agencies are involved in the management of consumer protection issues. This structure is tailored to the diverse range of financial services offered by traditional banks and non-bank institutions such as insurance providers, credit agencies, and lenders. This diversity of institutions can lead to complexity and potential overlap in the efficient enforcement of consumer protection rules. Moreover, with the rapid spread of FinTech, the need to strengthen consumer protection measures – including data protection and cybersecurity – is becoming even more important. Therefore, a robust coordination and oversight mechanism is required to ensure the effective implementation of consumer protection protocols by building consumer confidence and thereby fostering digital financial systems.

Another key challenge relates to changes in financial regulations and policies. In Indonesia, for example, the introduction of cashless payments through the Quick Response Code Indonesian Standard (QRIS) has been important to the growth and promotion of its digital financial system. The QRIS serves as a standardised QR code approved by the Bank of Indonesia that facilitates interoperability and connectivity amongst financial institutions, banks, interbank network providers, and e-wallets (*The Jakarta Post*, 2019). Since its launch in 2019, the user-friendly QRIS has successfully promoted digital payments via smartphones and integrated micro and small enterprises into the digital financial system, contributing to inclusivity.

However, the recent introduction of charges by Bank Indonesia, effective from 1 July, has raised concerns. The charges of 0.7% for medium and large enterprises and 0.3% for micro and small enterprises may disproportionately affect the latter, discouraging their adoption of digital payments and causing them to revert to cash-based payments (Ghifari, 2023). Therefore, it is paramount to create an enabling environment for inclusive digital financial services so that all individuals and businesses have access to affordable and user-friendly solutions. This requires collaborative efforts amongst stakeholders, including regulators; service providers, such as banks and FinTech companies; and users to ensure that policies and regulations continue to support an inclusive digital economy. Going forward, regulations and/or policies must be monitored for whether they are of assistance in narrowing down the existing disparities or widening the gaps.

As part of its regional commitment, ASEAN established the Working Committee on Financial Inclusion (WC-FINC) to address financial inclusion in the region. Several efforts have been made to ensure that the region achieves its goal of inclusive growth. In 2018, the ASEAN Inclusive Financial Index was launched to measure access to financial services, use of financial services, quality of financial services, and the overall enabling environment for financial inclusion. The WC-FINC also collaborates with international organisations such as the World Bank to examine the status of digital financial regulatory frameworks in AMS (World Bank and ASEAN, 2019).

Apart from the WC-FINC, some other initiatives have sought to enhance financial cooperation within the region. The ASEAN Bankers Association, ASEAN Financial Integration Network (AFIN), and ASEAN UP were established to promote financial cooperation within the region. The AFIN, established in 2017, aims to promote the wider adoption of FinTech innovation and development and to enhance economic integration in the region (Lee, 2017). While these initiatives play a role in helping understand the regulatory framework and financial services landscape within the region, specific population groups for integration into the digital financial systems still need to be identified to ensure an inclusive digital economy in ASEAN.

ASEAN's commitment to achieving inclusive digital finance is evident at both the national and regional levels. While national financial inclusion strategies are a cornerstone, well-coordinated efforts by policymakers and regulators are also critical to achieving the goals of inclusive digital finance. Government support plays a pivotal role in promoting and nurturing inclusive digital financial systems. Involvement of all stakeholders, including the private sector and non-governmental organisations (NGOs), remains essential to ensure that digital financial systems are designed to meet the goals of inclusiveness.

7. Digital Skills and Talent

Digital skills and talent are crucial for individuals to seize opportunities offered by the digital economy. These skills enable individuals to participate in and benefit from digital technologies. Digital skills can be understood in two ways – skills required for knowledge-intensive industries, such as STEM, and basic skills for using digital tools in daily life or basic business activities. The former often requires education and certification, while the latter can be acquired through on-the-job training or short courses. Without adequate digital skills, both

individuals and the business sector, including MSMEs, risk being excluded from the opportunities offered by the digital economy.

Digital literacy has been cited as the top barrier in realising ASEAN as a leading digital community and economic bloc, powered by secure and transformative digital services, technologies, and ecosystem (ASEAN, 2021a). While the working population in ASEAN has sufficient digital skills for basic computer use, coding, and digital reading, these skills are often self-taught and acquired through practical experience rather than formal training (Nathan Associates, 2021). Worryingly, the number of STEM graduates and employment in knowledge-intensive services remains low, highlighting the need for policy intervention (Nathan Associates, 2021). In the digital economy, STEM graduates are in high demand to drive growth industries, but there is often a shortage of such graduates.

Malaysia has the highest number of STEM graduates in the region. In 2022, the percentage of tertiary students in Malaysia graduating in STEM fields reached 43.5% of the total number of students graduating (Statista, 2023). The substantial proportion of STEM graduates in Malaysia is a direct result of the government's proactive measures to champion STEM education. A comprehensive range of initiatives has been implemented to stimulate greater interest in STEM fields and to bolster STEM graduate numbers to reach a target of 60% of all graduates, thus fostering a resilient talent pool in this domain (*Malay Mail*, 2021).

Enhancing digital literacy is another facet of Malaysia's approach, with a strong emphasis on STEM education both within formal educational settings and through informal avenues like co-curricular activities or engagement in programmes offered by affiliated institutions, such as the National Science Challenge (*Malay Mail*, 2021). Likewise, Singapore, renowned for its robust focus on banking, trade, and digital advancements, boasts a substantial contingent of STEM graduates, accounting for 36.3% of all recent graduates (Buchholz, 2023).

Malaysia and Singapore underscore the significance of enabling policies as well as the influence of market dynamics wherein the demand for STEM roles is substantial. They also highlight the crucial role of fostering STEM education and cultivating an ecosystem conducive to the expansion of the digital technology sector, ultimately fostering the emergence of skilled positions within knowledge-intensive domains. It is imperative to promote dialogues amongst stakeholders, such as industry sectors, education, and relevant government institutions, in designing policies to nurture STEM. Going forwards, it is also crucial to review the existing curricula in response to the rapid advancement of digital technologies. Sharing and exchanges of best practices in this endeavour will benefit countries with less experience. Robust data

systems, including the number of digital talents, specific skills, in-demand digital skills, and employability of degrees, are essential to drive these initiatives effectively.

Aside from relatively low number of STEM graduates, a gender gap also exists in technology related subject like STEM. The number of female STEM graduates and/or those working in STEM-related fields is significantly low across ASEAN. The study conducted by Sey (2020) found a significant correlation between women's digital literacy and the prevailing social and cultural norm. STEM-related studies and job opportunities are predominantly male-dominated, resulting in a limited representation of women in the field. As a result, inclusive digital literacy and talent must address gender issues in digital literacy. This requires a comprehensive approach involving a wide range of stakeholders from government institutions, educational institutions and the private sector. This issue is further discussed in the next section.

Businesses around the world had been forced to swiftly adopt digital technologies during the pandemic, which led to the need to equip employees with necessary digital skills. Large companies, in particular, showed a preference for hiring individuals with strong digital skills. In some countries, certain digital skills are critical. For example, Adobe Photoshop skills are in high demand in Indonesia and Malaysia, while JavaScript skills are in high demand in the Philippines and Singapore (Table 2). In addition, ICT is the top field of study for in-demand jobs in Indonesia and Malaysia, while computer science holds this distinction in the Philippines and Singapore.

Table 2: Top 5 Digital Skills in Demand by Country, September 2020–February 2021

No.	Indonesia	Malaysia	Philippines	Singapore
1	Adobe Photoshop	Adobe Photoshop	JavaScript	JavaScript
2	Adobe Illustrator	Adobe Illustrator	SQL	Java
3	Microsoft Office	JavaScript	HTML	SQL
4	JavaScript	SQL	Java	Python programming language
5	Logo design	Microsoft Office	Cascading Style Sheets	C#

Source: ADB and LinkedIn(2022).

The absence of the remaining AMS from this analysis accentuates the need for a comprehensive dataset encompassing the most sought-after digital skills and prominent areas of study for in-demand professionals across the ASEAN region. The provision of such data would furnish valuable insights into the digital employment landscape. Moreover, AMS, such as Brunei Darussalam, Singapore, Thailand, and Viet Nam, are projected to have more than 25% of their population consisting of those aged over 60 years by 2050, while Cambodia, Lao PDR, Myanmar, and Indonesia will have a large number of productive age groups compared to non-productive age groups (Martinus and Seth, 2023). These data will help examine the movement of skilled workers within the region to fill labour gaps in the coming years.

There are many studies on digital literacy, but most were conducted before the pandemic and may be outdated. The pandemic reshaped economies and social norms and accelerated the adoption of digital technologies. Having updated, ASEAN-focussed data covering all 10 AMS is critical to understanding the opportunities and challenges associated with improving digital skills and talent in the region. For example, the importance of digital marketing emerged during the pandemic, particularly in AMS where retail sectors play a major role in supporting the economy. At the same time, traditional digital skills such as web services are declining, while data analytics is becoming more important (ADB and LinkedIn, 2022). As a result, the need to upskill or to equip individuals, especially youth and women, with relevant digital skills is becoming an important consideration to ensure continued employment opportunities.

Global digitisation is leading to the rise of digital businesses; therefore, the demand for digital skills and talent is expected to continue. With this in mind, it is imperative to examine the digital readiness of individual AMS, taking into account the unique characteristics of market conditions. Such data are still scarce. The Digital Competitiveness Ranking is a starting point, however; the data are focussed on Indonesia, Malaysia, the Philippines, Singapore, and Thailand only and place them in the Asia-Pacific peer group. The lack of data may limit measuring digital readiness across the region. Furthermore, it is challenging to understand the disparities in digital readiness across ASEAN, let alone to study the causes. Therefore, addressing disparities in digital readiness in term of digital skills and talent across ASEAN will require robust data systems.

Addressing inclusive digital skills and talent is not solely a government responsibility. The private sector, academia, and NGOs can also be part of the solution for digital skills and the talent gap within the region. Several efforts by the private sector and international organisations have worked to improve digital skills and talent through formal and informal means. The largest digital companies in ASEAN – GoTo, Grab, and SEA, valued at over \$10

billion – require individuals to have intermediate or work-related digital skills to evaluate data and to develop original content, such as digital marketing, digital graphic design, data management, and business analytics (Martinus and Seth, 2023). As part of its strategy to improve digital inclusion and digital literacy in South-East Asia, Grab developed a social impact programme, GrabforGood, by offering Grab drivers and merchant partners the opportunity to access a Microsoft Digital Literacy certification programme through GrabAcademy, Grab's online training platform (Martinus and Seth, 2023). In 2021 alone, over 780,000 benefited from GrabforGood.

In addition, Grab partnered with government institutions such as the Infocomm Media Development Authority in Singapore to improve the digital literacy of a targeted 10,000 older persons within 1 year. In Indonesia, Grab supported two government digital literacy campaigns, Siberkreasi and the Digital Talent Scholarship, for its merchant partners and the general public (Martinus and Seth, 2023). These two programmes have supported the digital literacy development of more than 12,000 MSMEs. The GOAcademy talent incubator, a programme run by the NGO Yayasan Anak Bangsa Bisa, developed engineering bootcamps, tech competitions, and internship opportunities for young digital talent to prepare them for the Indonesian tech ecosystem (Martinus and Seth, 2023). Grab Unicorn Apprentice Programme in Viet Nam and the Grab Campus Apprenticeship Programme in Indonesia aim to equip students with in-demand technical skills by offering Microsoft's industry-recognised certification programme and applied learning opportunities through industry-relevant projects, competitions, and internships (Martinus and Seth, 2023).

Another successful multi-stakeholder collaboration to promote digital skills and talent is Go Digital ASEAN, a regional initiative that trained 2,084 trainers and 225,778 individuals across AMS from July 2020 to December 2021 (The Asia Foundation, 2021). Go Digital ASEAN focussed on upskilling marginalised groups such as MSMEs, women, youth, people with disabilities, and indigenous persons who were severely affected by the pandemic. The programme is currently in its second phase of implementation, organised by The Asian Foundation, government institutions in each AMS, and the ASEAN Coordinating Committee on MSMEs/ACCMSMEs, and is sponsored by Google.

The task of addressing inclusive digital literacy requires a concerted effort with the private sector, educational institutions, and NGOs. Going forwards, dialogue between multiple stakeholders should be a part of the solution.

8. Gender Disparities in the Digital Economy

An inclusive digital economy enables everyone – regardless of sex – to benefit from the opportunities offered by digital technologies. However, there is the challenge of creating equal opportunities for both sexes to participate in the digital economy. The number of women in digital technologies, especially in digital leadership, remains low. As half of ASEAN's working-age population is female, it is crucial to increase female representation in the digital economy. Data showed that the percentage of women in the entire population is the highest in Myanmar (52.2%), Cambodia (51.2%), Thailand (51.2%), Singapore (51.0%), and Viet Nam (50.2%), compared to Brunei Darussalam (47.4%), the Philippines (49.5%), Malaysia (49.8%), Indonesia (49.8%), and Lao PDR (49.9%) (ASEAN, 2021c).

Without gender-inclusive digital policies, women and girls – especially those from marginalised groups (e.g. low-skilled workers, migrant workers, persons with disabilities, and those living in rural and remote areas) – will be more likely to be left behind by the digital economy. Four distinct categories of the gender digital divide need to be addressed: (i) a gap in access to and use of the internet, (ii) a gap in digital skills and use of digital tools, (iii) a gap in participation in STEM, and (iv) a gap in leadership and entrepreneurship in the technology sector.¹⁴

In the digital age, the gender divide in internet connectivity is widening. In Asia and the Pacific, the percentage of men using the internet reached 67% in 2022, while women lagged behind at 61% (Statista, 2022b). The pandemic exacerbated this divide, with 59% of girls experiencing extreme difficulties with online learning; of these challenges, 60% were attributed to unreliable internet access and 20% to the physical lack of essential digital devices such as tablets and/or computers (Brewer, Jeong, Husar, 2022). GSMA, a global organisation that unifies the mobile ecosystem, highlighted the persistent inequalities in mobile device ownership and internet adoption globally, although the gender gap in both categories narrowed between 2017 and 2020. The onset of the pandemic in 2020 marked a reversal of this trend, resulting in the gap widening again. The ITU data for 2022 shows a global gap in internet use between men and women, with 69% of men accessing the internet compared to 63% of women, or 259 million more men. In East Asia and the Pacific, the gender gap in mobile internet usage falls from 4% in 2018 to 2% in 2021 (GSMA, 2022). Within this region, Indonesia has a gender

¹⁴ ITU, Bridging the Gender Divide, <https://www.itu.int/en/mediacentre/backgrounders/Pages/bridging-the-gender-divide.aspx>

gap of 8% in 2022, with 79% of men compared with 73% of women using mobile internet (GSMA, 2022).

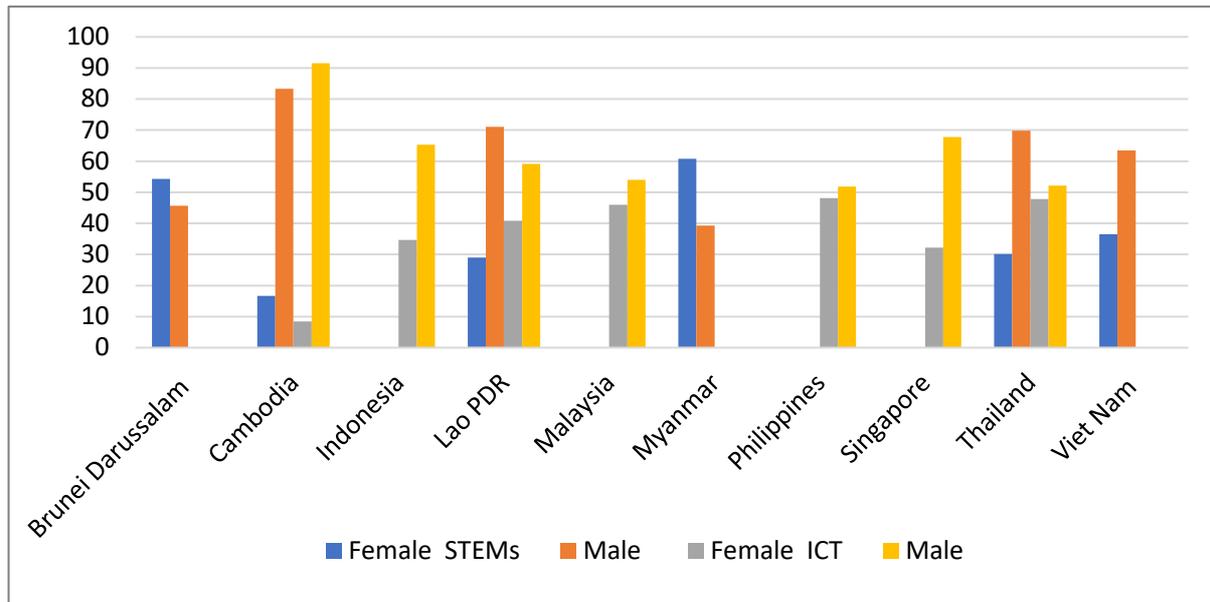
Despite efforts, achieving gender parity remains a challenge. The ITU's gender parity score, calculated as the percentage of women divided by the percentage of men, aims for values between 0.98 and 1.02 (ITU, 2023). However, global progress has been modest, moving from 0.90 in 2019 to 0.92 in 2022 (ITU, 2023). It is important to note that this score provides only a partial picture, as it represents the ratio between two percentages. In real terms, the gender gap increased by 20 million globally, as measured by the absolute difference between the number of men and women online (ITU, 2023).

Affordability of mobile handsets, poor digital literacy and skills, and weak online safety and security were identified as the main barriers to this gender gap (GSMA, 2022). It will not close on its own without policy intervention and the involvement of different stakeholders. The role of academia will be crucial in providing gender-disaggregated data to understand the barriers women face in owning mobile phones and accessing the internet. Instead of a focus on the affordability of internet services or digital devices, data on women's needs regarding internet connection are significant in understanding the decision for them not to go online.

Moreover, it is crucial to establish a comprehensive legal framework that supports women and girls in the digital technology sector, ensuring they have the means to seek legal recourse in cases of harassment or discrimination. Such a framework should provide clear mechanisms of reporting, investigation, and protection against digital harassment, thereby fostering a safer and more inclusive environment for women and girls in the digital economy. It will also be essential to raise awareness of the importance of internet connectivity and to improve digital literacy amongst women and girls to take advantage of the opportunities offered by the digital economy. In addition, promoting the safe use of the internet and ensuring a legal framework for online safety can increase women's confidence in using the internet.

There are stark gender disparities in education related to digital technologies, such as STEM and ICT, in some AMS. Despite having the highest percentage of females in its population, Cambodia has the lowest percentage of such female graduates compared to other AMS, 16.68% in STEM and 8.44% in ICT (WEF, 2022). Brunei Darussalam, which has the lowest female population in ASEAN, has a much higher proportion of female STEM graduates than Cambodia, Lao PDR, Thailand, and Viet Nam. Figure 13 compares the percentage of female and male STEM and ICT graduates in each AMS.

Figure 13: Female and Male Graduates in STEM and ICT in ASEAN
(% of graduates)



ICT = information and communications technology; Lao PDR = Lao People’s Democratic Republic; STEM = science, technology, engineering, and math.

Note: Zero value reveals unavailability of data on STEM graduates from Indonesia, Malaysia, Philippines, and Singapore. Data on ICT graduates from Brunei Darussalam, Myanmar, and Viet Nam are also unavailable.

Source: World Economic Forum (2022).

The Philippines ranks 4th out of 63 countries in terms of female researchers, followed by Thailand at 6th, Malaysia at 7th and Indonesia at 14th.¹⁵ Data also showed that Singapore ranks 42nd in terms of female researchers, despite its top performance in other measures of digital competitiveness. Nevertheless, women's participation in science in ASEAN is generally significantly better than in many other global regions. Data on women's representation in leadership and entrepreneurship in the technology sector to date are still scarce, however.

Although some AMS have made high-level commitments to ensure digital gender equality and to lead the region in equal digital access for both genders, the state of women's equality in digital leadership¹⁶ and entrepreneurship in ASEAN has yet to be elaborated (Sey and Kingsley, 2021). Research has highlighted the underrepresentation of women in technology leadership and entrepreneurship, but data to untangle the overall situation in each AMS – such as the underlying issues and challenges – are limited.

¹⁵ IMD, World Digital Competitiveness Ranking, <https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-digital-competitiveness-ranking/>

¹⁶ Digital leadership refers to participation in the digital economy in leadership roles such as management positions, entrepreneurship, and technology policymaking (Sey and Kingsley, 2021).

Four categories of gender inequality in digital leadership have been identified: people, structures and systems, policies, and the pandemic (Sey and Kingsley, 2021). Defining the root cause of the problem will allow for more focussed discussions, leading to targeted solutions. While there have been continuous efforts to address the gender gap or inequality in leadership and entrepreneurship in AMS, the nature of the problem – dimensions, causes, and solutions – has rarely been defined. As a result, the solution or recommendations offered are vague. In discussions on the digital economy, for example, women are portrayed as a marginalised group with limited digital skills and literacy, limited access to broadband internet access and digital finance, and at high risk of losing their jobs in the Fourth Industrial Revolution. The solutions, therefore, are too generalised to address the actual problem (Sey and Kingsley, 2021).

For a complex issue such as the gender gap in the digital economy, mapping symptoms and causes is a key element of the policymaking process and impacts the development of policy solutions and effectiveness of policy implementation (Sey and Kingsley, 2021). For example, a policy-related cause in Indonesia unintentionally discourages women from starting businesses because of limited access to finance. Traditional lending is based on collateral or asset ownership. As the percentage of women owning assets is lower than men – 35% compared to 43% – women entrepreneurs have limited access to finance without a male asset owner in their family who can co-sign the loan document (ADB, Oliver Wyman, MicroSave, 2017). This policy not only limits women's entrepreneurship but also shapes the perception that women rely on their male counterparts to start a business.

A number of efforts are being made to increase entrepreneurship in Indonesia, but they are not specifically focussed on improving the gender gap. For example, Kredit Usaha Rakyat, a loan facility that allows MSMEs to access finance with alternative collateral such as a viable and active business operation, is a successful solution to promote entrepreneurship amongst both sexes.¹⁷ This example shows how policy-related causes can be intertwined with people-related causes in shaping gender inequality, so that they also shape social beliefs and people's perceptions. Gender policies should be accompanied by a range of efforts to raise awareness that women have equal opportunities in accessing finance, starting a business, and taking on leadership roles. Media is also key in raising the awareness of women's equal opportunities in entrepreneurship and digital leadership.

¹⁷ OJK, Kredit Usaha Rakyat: Modal Usaha Didapat Perekonomian Jadi Sehat!, Jakarta, <https://sikapiuangmu.ojk.go.id/FrontEnd/CMS/Article/10392>

There is also a strong correlation between women's digital literacy and the prevalence of social and cultural norms (Sey and Kingsley, 2021). Some communities are uncomfortable with girls entering the technology field, because, for instance, these jobs may take more time away from home and require girls to work at night (Sey and Kingsley, 2021). Such fields are also male dominated, which can make families uncomfortable; girls then internalise and accept this perception (Sey, 2021). This social perception limits women's educational choices at an early stage in their lives as well as opportunities to work in digital-related industries, which ultimately hinders women's ability to play active roles in the digital economy.

Gender-responsive policies in the digital economy play pivotal roles in promoting equal representation of both genders in the digital technology sector, whether in education, the workforce, or business. Regulatory frameworks must be in place to ensure a safe environment for women in work or education. Further, a shift in societal perspective is necessary; digital technology is gender-neutral, and technology is for everyone. The rapid development of digital technologies – which will drive the demand for digital skills, increasing women's representation amongst STEM graduates, entrepreneurs, and leaders in the technology sector – is paramount to their integration into the knowledge-based workforce and active participation in the digital economy.

As a starting point, it is imperative to obtain data on gender disparities in the ASEAN region, including in technology leadership and entrepreneurship, STEM graduates, digital finance, broadband internet access, and MSME ownership by sex. The heavy reliance on global data – especially from Europe or North America – to characterise women's inequality only highlights the need to improve the collection of gender-disaggregated data within the ASEAN economy (Sey, 2021).

9. Micro, Small, and Medium-Sized Enterprises (MSMEs)

MSMEs have played a central role in ASEAN's economic growth, accounting for 85% of employment and contributing 44.8% of regional gross domestic product (Google and ICC, 2022). By 2022, there were more than 70 million MSMEs in South-East Asia, including micro businesses such as *warung* in Indonesia and *sari-sari* shops in the Philippines, making a significant contribution to the region's social and economic development (Google, Temasek, Bain & Company, 2022). This number is only expected to grow in the coming years.

As the region moves towards digital integration, the need for strategic policies to enhance the performance of MSMEs in exports and their integration into GVCs is becoming apparent.

Yet despite the rapid growth of the digital economy, MSMEs face numerous challenges that prevent them from fully realising their potential. These challenges include limited access to broadband internet, lack of access to finance, limited digital skills, and insufficient adoption of digital technologies such as e-commerce and digital marketing. In addition, the under-representation of MSMEs in international markets and GVCs remains an obstacle. Without appropriate policy interventions, MSMEs risk missing out on opportunities for expansion and development.

One study revealed the existing disparities in MSME representation in GVCs and export activity across the region. In principle, many AMS have national policies and strategies to support MSMEs in exporting. Indonesia, Malaysia, Singapore, and Thailand are at an advanced stage of supporting MSME participation in exporting; Brunei Darussalam, the Philippines, and Viet Nam are at an intermediate stage; and Cambodia, Lao PDR, and Myanmar are still at an early stage (OECD and ERIA, 2018). The advanced AMS have developed comprehensive export promotion programmes for MSMEs, and some have translated these programmes into strategic objectives and plans to increase MSME export activity (e.g. Malaysia's Going Export Programme). Indonesia, Malaysia, the Philippines, Singapore, and Thailand also have well-developed policy programmes and funding to support MSME exports, like facilitating MSME participation in major trade fairs and assisting MSMEs with marketing, product development, trade policy information, and market intelligence to comply with free trade agreements. Export promotion activities in early-stage AMS tend to be scattered and ad hoc, such as participation in trade fairs and export training. Cambodia currently falls behind other AMS in initiatives to support MSMEs in navigating the country's free trade agreements, while Myanmar and Lao PDR face challenges in facilitating self-certification and compliance with rules of origin.

MSMEs are also under-represented in GVCs. While not all can be integrated into GVCs, they can benefit both on the buying side (through access to more sophisticated and competitively priced inputs) and selling side (through new opportunities to fill a supply niche and specialise) (López González, 2017). Going forwards, policy interventions in trade facilitation and GVCs are important in improving the internationalisation of MSMEs in the region. This requires strategic policies that do not focus on specific sectors or industries but support a wide range.

Connectivity persists as a challenge amongst many ASEAN MSMEs as well. As noted previously, broadband internet has yet to be accessible for many, due to lack of infrastructure development in rural and remote areas and the affordability of services. Many AMS have been trying to bridge the digital divide between urban and rural areas, but such a divide remains,

especially in archipelago countries where the topography hinders infrastructure development. Although the mobile broadband penetration rate in ASEAN is relatively high, the fixed broadband internet penetration rate is still low, which signals a lack of competition in the broadband internet value chain. Additionally, the price of fixed broadband internet access is relatively high in the region. The high cost is also a barrier for various groups, including micro and small enterprises, limiting their active participation in the digital economy.

To facilitate the integration of these businesses into the digital landscape, addressing connectivity issues is critical, especially because many MSMEs are located in rural areas. Furthermore, specific data related to MSME accessibility to fixed broadband internet are difficult to find, making it difficult to measure the affordability for MSMEs. In terms of affordability, most data are measured as a percentage of GNI per capita, which is relevant for individuals and households. Because of this, measuring the digital divide amongst ASEAN MSMEs in big cities and rural areas cannot occur. Availability of such data would help identify connectivity gaps pertaining to enterprise size and location.

One report highlighted the seriousness of internet affordability for MSMEs. Unlike high-income countries, where connectivity data disaggregated by business size are widely available, low- and middle-income countries do not have aggregated data on the total number of businesses with internet access (Broadband Commission for Sustainable Development 2022).¹⁸ Going forwards, it is important to collect specific data related to MSME accessibility to fixed broadband internet both aggregated and disaggregated by enterprise size. Analysing connectivity gaps in terms of enterprise size will help identify enterprises that do not have the same access to the opportunities offered by the digital transformation and determine the reason (OECD, 2019). Moreover, such data would offer valuable information to understand MSME needs for broadband internet access based on the actual characteristics of their businesses.

MSMEs also face significant challenges in accessing finance, particularly when seeking loans from traditional banks. This difficulty arises from factors such as their limited ability to provide credible financial statements, insufficient assets for use as collateral, and a lack of established banking and credit history (ADB, Oliver Wyman, MicroSave, 2017). Lending to the MSME segment is often seen as unprofitable for banks once risk profiles – or lack thereof – are considered (Carandang and Canaveral, 2022).

¹⁸ Micro enterprises may find that a smartphone with wireless internet access is sufficient to run their businesses, especially for social media-based online sales (Broadband Commission of Sustainable Development, 2022).

Fortunately, the advancement of digital technologies is opening up opportunities for innovative financial services, such as FinTech. This innovative way of accessing finance allows MSMEs to expand their businesses in the digital economy. For example, First Circle in the Philippines has lent millions of dollars annually to underbanked MSMEs by using a risk engine based on proprietary data collected from mapping thousands of business-to-business supply chain transactions since 2016. This allows it to further segment the MSME market into smaller homogeneous groups with similar working capital needs and risk profiles (Carandang and Canaverall, 2022). First Circle is a successful case of simplifying the credit requirements faced by the MSME segment, proving that the availability of data on the MSME market segment is needed by financial institutions for loans.

The solution to MSMEs' challenges in accessing finance should not be the sole responsibility of the private sector. Traditional financial institutions, together with the government, can also address MSMEs' challenges in accessing finance. In Indonesia, for example, Kredit Usaha Rakyat allows MSMEs to access finance with alternative collateral. Instead of additional collateral, it requires a viable and active business operation for at least 6 months or an object already financed by Kredit Usaha Rakyat.¹⁹ Kredit Usaha Rakyat is a government-subsidised financing programme in which 100% of the funds belong to bank or non-bank financial institutions. With the government subsidising the interest on the loan, MSMEs are able to access financing with low interest rates. Kredit Usaha Rakyat interest rate has continued to decline from 24% in 2008 to 6% in 2020.²⁰

The Government of Indonesia has also digitised other programme credit schemes (e.g. Ultra Micro) and developed the Mobile Credit Programme Information System app to facilitate MSME access to finance. DigiPay is a platform linking government procurement agencies, MSMEs, and banks. In addition, the private sector is developing a comprehensive ecosystem to facilitate MSME access to financial services, including the development of 'super apps' that allow MSMEs to access finance and to purchase insurance through their mobile devices.

At the regional level, ASEAN is committed to improving access to finance for MSMEs as part of efforts to achieve inclusive finance in the region. The *ASEAN Strategic Action Plan for SME Development 2016–2025*, which includes a number of key initiatives and targets, is currently being implemented. During recent ASEAN Summit-related events in March 2023, a high-level policy dialogue was held to promote digital financial inclusion and literacy for

¹⁹OJK, Kredit Usaha Rakyat: Modal Usaha Didapat Perekonomian Jadi Sehat!, Jakarta, <https://sikapiuangmu.ojk.go.id/FrontEnd/CMS/Article/10392>

²⁰ Kredit Usaha Rakyat, Gambaran Umum, <https://kur.ekon.go.id/gambaran-umum>

MSMEs. It highlighted the importance of having an ASEAN MSME database that distinguishes and identifies the level of inclusiveness, governance, and capabilities of MSMEs (Government of Indonesia, Ministry of Finance, 2023). Such a database will not only benefit policymakers but also academics and regional thinktanks to gain in-depth insights into the MSME landscape in ASEAN. At the regional level, policy dialogue and/or fora are paramount to share best practices within the region and to cultivate ideas and initiatives to address MSME access to finance.

Another key factor that is closely related to the adoption of digital technology is the level of digital skills. Many micro and small enterprises often run their businesses in a traditional way, without realising the importance of having basic ICT equipment such as a computer (ERIA, 2018). Management is done conventionally, for example, by recording cash flows in writing rather than using spreadsheets. During the pandemic, the adoption of digital technologies and tools by MSMEs increased dramatically, however. It was this digital transformation – such as moving from cash to cashless payments and from physical stores to online shopping – enabled MSMEs to thrive during difficult times. This adoption of digital technologies and tools continues in the aftermath of the pandemic as going digital has become a new way of life. As the adoption of digital technologies intersects with digital skills, a regulatory framework that promotes the adoption and upgrading or upskilling of digital skills is an important aspect to increase MSMEs' awareness and confidence in using digital technologies to support their business.

The more established MSMEs, such as those engaged in exporting, show better performance in the adoption of digital technologies. A study conducted by Google and the International Chamber of Commerce in 2022 surveyed 1,560 MSMEs engaged in exporting from AMS. The study found that 70% of respondents saw digital technologies and tools as a means to access new markets, and 80% had increased their use of digital tools in the last 2 years (Google and International Chamber of Commerce, 2022). While these data reflect a positive trend in the adoption of digital technologies by exporting MSMEs in the region, data on the adoption of digital technologies by MSMEs in the domestic market are limited. It is important to prioritise further research on the adoption of digital technology amongst MSMEs, with a particular focus on micro and small enterprises in domestic markets. Given that this group of MSMEs were most affected by the pandemic – with many facing bankruptcies due to limited resources and poor capacity for rapid digitisation – the availability of this data is timely. Such data will prove invaluable in designing evidence-based policies and/or initiatives.

MSMEs are interested in using digital technologies and applications for accessing new markets and increasing sales as well. A 2018 study found that many MSMEs in ASEAN were focussed on increasing sales through digitalisation; consequently, attracting MSMEs through e-commerce-related programmes and providing comprehensive information on various services could be effective (ERIA, 2018). The study revealed that 56% of MSMEs in ASEAN use basic digital tools such as Microsoft Word, e-mail, WhatsApp, computers, and mobile phones (ERIA, 2018). Surprisingly, only 34% had an online presence, while only 10% were integrating advanced digital tools such as enterprise resource planning, customer relationship management, big data analytics, and automation into their core business operations (ERIA, 2018). Yet this stage of digital technology adoption is likely to undergo a substantial shift following the pandemic; in particular, the number of MSMEs with an online presence could increase significantly. This shift is mainly due to the fact that market visibility became a critical factor for the survival of MSMEs during the pandemic. Thus, there is a need to update the state of digital technology adoption amongst MSMEs in ASEAN to help policymakers make informed decisions and design appropriate initiatives that are in line with the current digital landscape.

As MSMEs strive to integrate digital technologies into their businesses, they often face a lack of digital skills to navigate digital technologies. Adoption of digital technologies must accompany the development of digital skills and knowledge. Digital skills enable MSMEs to build marketing strategies; process data efficiently; discover new markets; strengthen consumer engagement; and delve into complicated areas such as data analytics, cloud computing, artificial intelligence, and UX design. However, several studies have revealed a stark reality – micro and small enterprises often struggle with limited understanding or lack of familiarity with digital technology tools. Lack of local content also presents challenges for MSMEs to use digital technology tools.

This is an area where the private sector, NGOs, and civil society organisations become important. One successful example is Go Digital ASEAN, which has a strong focus on women (70% of participants), those from rural or peri-urban areas (60% of trainees), and those with a high school education or less (The Asian Foundation, 2022). It demonstrates that creating an inclusive digital economy for MSMEs is not only the role of the government; private sector involvement is paramount to integrating MSMEs into the digital economy. Another successful case is the training programme offered by Grab. Going forwards, public–private dialogues should occur regularly to formulate relevant programmes for MSMEs to take part in the digital economy.

10. Policy Recommendations

Overall, ‘inclusive digital economy’ is a broad term that necessitates well-defined goals and/or objectives. It requires periodical monitoring and evaluation of the defined goals and/or objectives. Addressing an inclusive digital economy can thus be measured using qualifiable and quantifiable measures. Moreover, addressing income inequalities is crucial to fostering an inclusive digital economy, especially the gap between urban centres and rural areas. Policy interventions play a key role in bridging these gaps, particularly by creating economic opportunities in rural areas. An inclusive digital economy requires robust data systems that reflect the current situation at the national and regional level. The creation of comprehensive databases covering different dimensions of digital inclusion, such as broadband internet access, digital skills, and the use of digital technologies in key sectors, can provide valuable insights into national and regional contexts.

10.1. General

- (i) **Establish dedicated ASEAN data collection focussed on the 10 AMS that will showcase the strength and uniqueness of the region.** The ASEAN-centric data collection will provide a comprehensive understanding of the digital economy landscape within the region, given the rapid economic growth and adoption of digital technologies in ASEAN. Data collection will also serve as a valuable resource for policymakers, researchers, and stakeholders. Collaboration with universities, research institutions, international organisations, and NGOs is necessary to address the need for ASEAN-centric data. Strengthening the Statistical Division of the ASEAN Secretariat is imperative to support the work of an inclusive digital economy.
- (ii) **Develop standardisation of data collection methods and formats across AMS, including mechanisms for sharing data and insights on an inclusive digital economy.** Such data and insights will be a useful reference for learning from best practices.
- (iii) **Define marginalised populations.** When discussing ASEAN's journey towards an inclusive digital economy, it is imperative to clearly define which populations are potentially marginalised or under-represented in the digital economy. It is equally important to understand the specific characteristics of these groups, such as geographical location, income levels, age demographics, sex distribution, education levels, and occupational backgrounds.

- (iv) **Stocktake ASEAN initiatives related to the digital economy and/or inclusive digital economy.** Information should be made available to the public to enrich the discussion on an inclusive ASEAN digital economy. Public availability of such information can help avoid duplication of initiatives as well.
- (v) **Encourage public–private collaboration.** Public–private dialogues play an important role in highlighting the importance of an inclusive digital economy. Promoting an inclusive digital economy requires cooperation amongst different stakeholders, including governments, the private sector, NGOs, civil society organisations, and academia.

10.2. Broadband Connectivity

- (i) **Promote competition in the broadband market to foster innovation and to reduce prices.** This entails implementing regulations to curb anti-competitive practices and streamlining the regulatory approval process, as well as simplifying procedures for obtaining permits for broadband infrastructure development.
- (ii) **Modernise spectrum policies.** This can be done by regularly updating spectrum policies and embracing technology-neutral and flexible allocations to accommodate emerging technologies, such as 5G.
- (iii) **Review spectrum fee policy and encourage competition.** This will promote more competitive participation in technology deployment, ensuring that it aligns with the needs of the evolving digital economy.
- (iv) **Update national broadband plans for technological alignment and inclusive connectivity.** It is essential to revise these plans to align with the rapid pace of technological advancement while embracing inclusive broadband policies. They should emphasise expanding broadband access to rural and remote areas, fostering equitable digital connectivity.
- (v) **Gather data on broadband internet access, with a particular focus on rural areas.** This will help gain insight into the digital divide between rural areas and big cities. Additionally, data on subscription prices, internet speed and latency, and penetration rates can help identify regions in need of additional infrastructure development to ensure that remote and underserved areas, low-income individuals, and micro and small enterprises are included in the digital transformation.

10.3. Digital Financial Services

- (i) **Gather data on specific unbanked population segments.** This will help understand their characteristics and requirements for integration into the digital financial system.
- (ii) **Regularly update FinTech policies and regulations to align with evolving market dynamics.** Ongoing monitoring of FinTech performance is crucial.
- (iii) **Ensure rigorous enforcement, monitoring and evaluation of laws, pertaining to consumer protection, personal data security, and cybersecurity.** This will safeguard individuals and organisations in the digital economy.

10.4. Digital Skills and Talents

- (i) **Foster collaboration amongst diverse stakeholders, including the private sector, academia, NGOs, and government institutions, to create comprehensive digital skills training programmes.** These programmes should prioritise reaching underserved and marginalised communities, ensuring that no one is left behind in the digital skills development journey.
- (ii) **Launch public awareness campaigns highlighting the significance of continuous education in the digital age.** Individuals should be encouraged to regularly update their digital skills and competencies to adapt to evolving technologies. The concept of lifelong learning should be promoted by providing accessible and diverse digital skills training and upskilling opportunities, which extend beyond formal education.
- (iii) **Collaborate with stakeholders for inclusive digital skills and talents.** Collaboration amongst the private sector, academia, NGOs, and government institutions is essential to enhance digital skills and talents. Digital skills training programmes must also specifically reach those in underserved or marginalised communities.
- (iv) **Raise awareness of the importance of continuous learning in the digital age.** This will enhance individuals' understanding on the need to regularly update their digital skills and competencies to adapt to evolving technologies. Digital skills training/upskilling should not be limited to formal education but should extend to lifelong learning opportunities.
- (v) **Establish and support digital entrepreneurship and innovation programmes, including business incubators and grants, with a specific focus on engaging and empowering youth and individuals from underrepresented communities.** These

programmes should provide training, mentorship, and financial support to help aspiring entrepreneurs turn their digital ideas to viable businesses.

- (vi) **Gather data on digital literacy, in particular vocational training and on-the-job training for unskilled or low skilled workers.** Such data can shed light on the readiness of the population to use digital technologies, facilitating effective education and training initiatives.

10.5. Gender Disparities in the Digital Economy

- (i) **Recognise the significance of gender equality in the digital economy and technology sector.** Female representation should be actively promoted in technology-related education and employment, both at national and regional levels. For this reason, multiple stakeholders such as the private sector, civil society organisations, and governments must be involved, undertaking concrete actions to increase the participation of women and girls in such fields.
- (ii) **Establish supportive inclusion for women and girls in the digital technology sector.** Frameworks should include protection against gender discrimination as well as mechanisms for reporting and addressing gender-related grievances in workplace, online harassment, cyber-bullying, and other gender-based digital violence.
- (iii) **Raise awareness of gender disparities.** This can be done through public awareness campaigns to shed light on gender disparities in the digital technology sector and the importance of female representation.
- (iv) **Collect gender-disaggregated data pertaining to the digital economy and technology sector, particularly on digital access, skills, use, and leadership.** Such a database can highlight areas of inequality and drive initiatives to help close the digital gender gap. These data are essential for monitoring progress and identifying areas where gender disparities persist.
- (v) **Share knowledge in the region.** Information, best practices, and research findings related to digital economy inclusion should be shared throughout the ASEAN region. Additionally, forging closer cooperation with dialogue partners and other institutions through various development initiatives is important.

10.6. Micro, Small, and Medium-Sized Enterprises

- (i) **Gather data on characteristic MSMEs in big cities and rural areas, especially on type of business, digital technology adoption, and digital skills.** It is also essential to collect specific data related to MSME accessibility to fixed broadband internet, both aggregated and disaggregated by enterprise size.
- (ii) **Gather data on the use of digital technologies and/or the adoption of digital technologies for MSMEs.** The data can provide insights into their benefits for all segments of the population.
- (iii) **Create local content that can be easily understood by all.** The availability of such content will assist MSMEs in understanding business opportunities, training, or other educational programmes.
- (iv) **Update the ASEAN SME Policy Index to incorporate digital economy components, including the adoption of digital technology, digital skills, and broadband internet access.** This updated index will better reflect the evolving needs and challenges of MSMEs in the digital era, enabling policymakers to design more effective and targeted support measures for MSMEs in ASEAN.
- (v) **Monitor and evaluate policies pertaining to supporting MSME export and participation in GVCs.**

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