

LEVERAGING DIGITALIZATION TO FOSTER SUSTAINABLE DEVELOPMENT IN LLDCs

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ABSTRACT

Digitalization offers a significant opportunity for sustainable development in landlocked developing countries (LLDCs) in Asia and the Pacific, helping them overcome geographic and infrastructural barriers. This brief discusses how digital technologies can expand access to global markets, boost entrepreneurship, and improve essential services like mobile banking and telemedicine,

which are crucial for economic growth and societal advancement. It emphasizes the need for continued government involvement in expanding infrastructure and refining regulations to maximize the benefits of the digital economy, ensuring that growth is inclusive and equitable across these regions.

1. INTRODUCTION

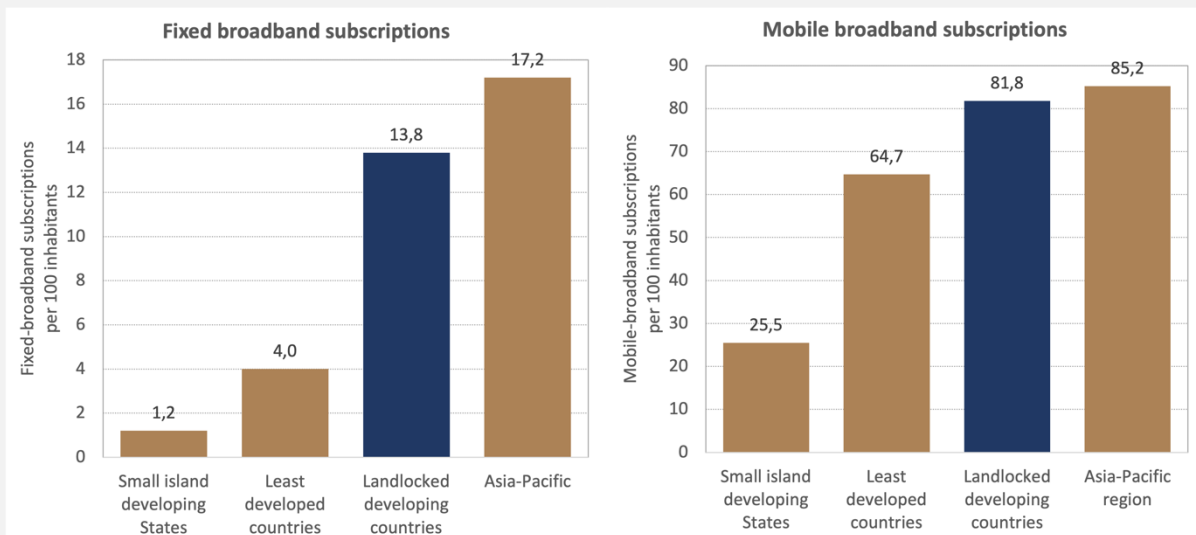
Digitalization presents a transformative opportunity for landlocked developing countries (LLDCs) to overcome traditional infrastructure, geographical, and trade barriers, thereby supporting their developmental objectives. Government interventions have been instrumental in driving the digital transformation of LLDCs, especially those in North and Central Asia. Infrastructure expansion in particular, has resulted in affordable access to broadband services and a significant amount in mobile broadband subscriptions (figure 1) surpassing the other countries in special situations.¹ This has placed LLDCs in a position to embrace innovation and accelerate socioeconomic development by accessing new digital tools and global markets, fostering job creation and facilitating essential services such as mobile banking and telemedicine.

However, despite the establishment of an affordable and robust digital infrastructure, sustained efforts in regulatory refinement and infrastructure expansion are imperative to fully unlock the potential of the digital economy while

effectively managing its inherent risks. This is particularly crucial for the LLDCs where addressing rural-urban disparities is paramount in preventing the widening of skill gaps and exacerbating social inequalities. Additionally, strategic regulatory advancements, coupled with targeted initiatives and regional collaboration, are needed to empower nations to capitalize on emerging economic opportunities and attract foreign investments, thereby serving as catalysts for the continual growth of the digital sector and harnessing the full benefits of digitalization.

Accordingly, this policy brief aims to highlight the potential of digitalization in LLDCs in Asia and the Pacific. It approaches this by analysing the current situation and challenges within this domain and providing pertinent policy recommendations to address them and further capitalize on the benefits of digitalisation.

Figure 1: Access to fixed and mobile broadband subscriptions per 100 inhabitants, weighted averages, in Asia-Pacific countries in special situations



Sources: ITU, World Telecommunications and ICT Indicators Database, 26th edition

¹ The countries in special situations are a group of developing countries confronted by deep structural impediments to attaining sustainable development. They include least developed countries, landlocked developing countries and small islands developing States.

2. OPPORTUNITIES

LLDCs are poised to seize the transformative opportunities presented by digitalization. This section explores how digital innovations can drive sustainable development and economic growth in LLDCs, unlocking their full potential in the global digital economy.

Effectively embracing of digitalization can offer significant economic opportunities by opening doors to global markets, fostering entrepreneurship, and revolutionizing essential service delivery. Advancements in digital technologies and communications has greatly increased the trade potential of LLDCs. For instance, in the service sector, IT services, online education, and telemedicine can now reach global audiences without physical presence. This shift is further accelerated by digital platforms that provide equal access to global markets, encouraging entrepreneurship and employment growth. This is particularly advantageous for the remote, rural regions of LLDCs, where it enables economies of scale.

Additionally, the emergence of global freelancing platforms offers new avenues for LLDC workers, while online marketplaces and social media empower artisans to exhibit their products globally. This not only increases income but also reduces reliance on traditional middlemen and offers a path for LLDCs to expand their footprint in business services exports.

Moreover, digital technologies are revolutionizing the provision of essential services such as mobile banking, online education, and telemedicine. These cost-effective solutions are crucial for countries in special situations as it enables the provision of efficient and accessible services essential for their progress and development.

Nepal's efforts in developing a comprehensive digital policy serves as a prime example of harnessing this digital potential to spur economic growth, address social challenges, and enhance

global integration. With a strategic focus on ICT skill development and leveraging high internet penetration and smartphone usage, Nepal has embarked on over 80 digital initiatives spanning crucial sectors such as digital foundation, agriculture, health, education, energy, tourism, finance, and urban infrastructure. These initiatives aim to provide online market access, particularly benefiting local entrepreneurship such as Nepalese artisans, while meeting global demands and stimulating domestic innovation. Nepal's proactive approach underscores its commitment to leveraging digital technologies as catalysts for inclusive economic development and positioning itself competitively in the global economy (ESCAP, 2024).

Harnessing digital tools strategically can significantly boost productivity and foster the creation of quality employment opportunities. These technologies offer advantages that enhance efficiency, safety, and transparency across various sectors. This is particularly crucial for LLDCs, where mining and commodity exports play a substantial role in the economy.

Digital solutions, such as advanced mapping software and machine automation, have revolutionized industries like mining in LLDCs, leading to heightened efficiency, reliability, and cost-effectiveness. For instance, in Kazakhstan, where mining contributes 13% to the GDP, the adoption of digital tools has enabled the sector to adapt to increasingly complex and competitive conditions. Statistics indicate a remarkable 38.9% increase in labour productivity growth within the "Mining industry and quarrying" sector in 2022 compared to 2016, highlighting the transformative impact of digitalization. By embracing digital technologies strategically, LLDCs can unlock new avenues for economic growth and competitiveness while ensuring sustainable development (Mukanov, 2023).

3. CHALLENGES

LLDCs in the Asia-Pacific region are confronted by formidable challenges as they endeavour to embrace digitalization. Understanding and addressing these challenges is essential for crafting effective policies and strategies that will enable LLDCs to navigate the digital landscape successfully.

In LLDCs across Asia and the Pacific, ensuring universal connectivity presents a multifaceted challenge. Factors such as low population density and rugged terrains render the laying of fiber-optic cables economically unviable in many regions. Consequently, inhabitants of remote rural areas often rely on lower-quality Internet infrastructure with limited bandwidth and speed, hampering their access to digital services (Internet Society, 2018).

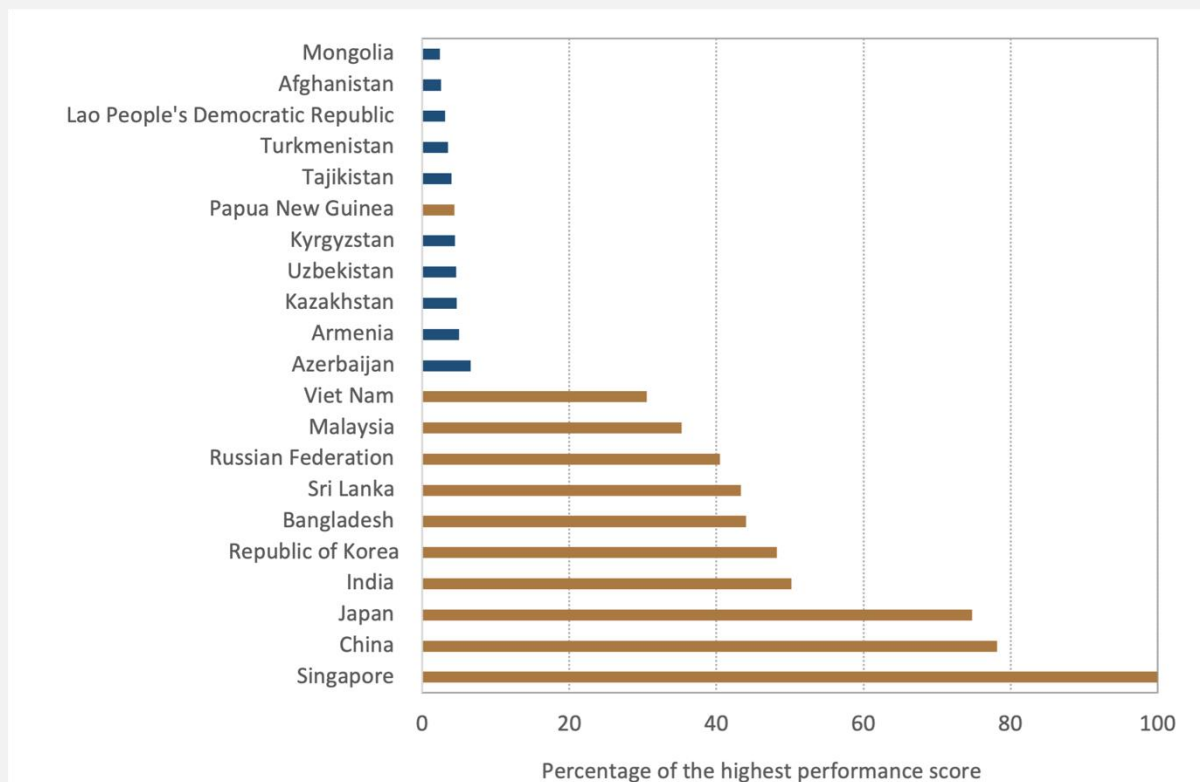
Disparities in bandwidth connectivity and quality exacerbate the digital divide, potentially deepening inequalities between income groups and rural and urban region. Higher-income individuals are more likely to access and afford superior digital services, potentially creating a digital divide that disproportionately affects those in rural or underdeveloped sectors.

LLDCs frequently face financial constraints hindering their developmental progress. These countries heavily rely on public resources, which have often fallen short in meeting their diverse needs. Additionally, limited private sector investment, including Foreign Direct Investment (FDI), persists due to restrictive domestic policies and the prevalence of State-owned enterprises. This poses a significant challenge, considering the substantial benefits that such investments could bring, particularly in infrastructure development. Unlocking private sector participation could alleviate fiscal pressures and lead to valuable outcomes such as skill enhancement, technology transfer, and efficiency improvements (Meng, Tateno, & Norbu, 2022).

There remains a notable absence of regional collaboration, particularly concerning interoperability and digitalization, despite their potential for socioeconomic advancement. The transport sector stands out as a prime area where cooperation could yield substantial benefits. LLDCs in Asia and the Pacific exhibit notable deficiencies in this domain, highlighting connectivity challenges (figure 2). Nonetheless, during the pandemic, LLDCs, especially in North and Central Asia, showcased their resilience by streamlining transport operations and simplifying customs procedures to expedite the movement of essential goods. Extending these digital initiatives to broader cargo supplies has the potential to significantly enhance transport connectivity and efficiency. Moreover, fostering cooperation can assist countries in establishing themselves as dependable partners for international freight transport, thereby unlocking opportunities for international trade (ESCAP, 2023).

The rapid expansion and use of digital technologies in LLDCs across Asia and the Pacific brings with it myriad risks. The informal economy in particular is susceptible to risks as digital platforms can exacerbate exploitation, offering unfair wages, scant job security, and limited social security benefits. Insufficient digital literacy also poses a looming threat of personal data exploitation and privacy breaches. Moreover, overreliance on specific digital platforms heightens vulnerabilities, magnifying the impact of policy shifts or fee adjustments imposed by these platforms. This is especially worrisome since cybersecurity readiness varies significantly among LLDCs in the region with only a fraction of LLDCs enacting data protection legislation, and overall cybersecurity readiness remaining a concern (ESCAP, 2024). Where countries like Kazakhstan and Azerbaijan demonstrate strong performances, several other LLDCs like Turkmenistan, Tajikistan and Bhutan rank very low on the Global Cybersecurity Index (table 1). Efforts to bolster cybersecurity and bridge the digital divide are imperative to protect the interests and safety of LLDCs in the face of rapid digitalization and increased interconnectivity between countries.

Figure 2. ESCAP transport connectivity index, as a percentage of the highest performer's score, for selected Asia-Pacific countries



Source: (ESCAP, 2019)

Note: The blue bars represent the LLDCs, and the brown bars represent other countries in Asia and the Pacific

Table 1 Global Cybersecurity Index Scores 2020

Asia-Pacific LLDCs	GCI 2020 Score
Kazakhstan	93.15
Azerbaijan	89.31
Uzbekistan	71.11
Armenia	50.57
Kyrgyzstan	49.64
Nepal	44.99
Mongolia	26.2
Lao P.D.R.	20.34
Bhutan	18.34
Tajikistan	17.1
Turkmenistan	14.48

Source: International Telecommunications Union (ITU), (2021)

These challenges underscore the need for comprehensive strategies and collaborative efforts to address infrastructure limitations, bridge the digital divide, unlock investments and ensure the

safe use of digital services to achieve the full transformative potential of digital technologies in the region.

4. POLICY RECOMMENDATION

In the realm of digitalization, Asian LLDCs hold immense potential for growth and development. This section offers targeted policy recommendations to harness this potential effectively. Through strategic initiatives like bolstering digital infrastructure, modernizing trade and economic regulations and fostering regional cooperation, LLDCs can navigate the digital landscape to drive inclusive economic growth and sustainable development.

To unlock the full potential of digitalization in LLDCs across Asia-Pacific, strategic policies should prioritize expanding digital and telecommunications infrastructure, including ensuring reliable electricity and robust internet connectivity in rural areas. These initiatives, along with implementing skill development programs, are crucial for overcoming the geographical and infrastructural challenges inherent to LLDCs. They ensure equitable access to digital technologies and the socio-economic benefits they bring.

Enhancing digital literacy is paramount. Initiatives like the Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT) provide capacity-building programmes and e-learning courses to train government officials. Additionally, governments

of LLDCs should implement programmes to teach digital literacy to primary and secondary school children and teachers, thus advancing the ongoing digital transformation in the region.

Additionally, it becomes increasingly crucial to enhance individuals' fundamental comprehension of effectively managing and securely sharing digital data. This stands as a foundational requirement for digital advancement. LLDCs must thus also establish comprehensive regulatory frameworks concerning data privacy, protection, information security, trust, and cybersecurity.

These policies not only bridge the digital divide but also foster sustainable development through improving access to education, and economic opportunities in geographically disadvantaged regions. Targeted government initiatives, such as GIGA (Box 1) and other skill development programs, play a pivotal role in equipping individuals with the necessary digital skills to thrive in the digital economy. It's essential to mitigate skill divides and provide equal opportunities for all, especially targeting rural areas.

Box 1. The Giga Initiative, launched in 2019 by UNICEF and the International Telecommunication Union (ITU), aims to connect every school to broadband internet, promoting digital learning. Operating in 30 countries, including four Asian LLDCs, Giga offers open-source connectivity solutions and technical assistance for school mapping, infrastructure planning, and connectivity monitoring. In **Kazakhstan**, despite national procurement challenges, Giga partnered with the local government to extend high-speed internet to 38 remote schools, prompting advocacy for regulatory reforms. In **Kyrgyzstan**, Giga's solutions led to reduced internet costs and doubled connection speeds nationwide. In **Uzbekistan**, Giga pioneers innovative financing models, such as "schools-as-hubs," where schools generate revenue by providing internet access to surrounding communities. The Giga Initiative exemplifies a progressive approach to bridging the digital divide in education through technological advancement, regulatory reform, and innovative business models.

Sources: UNICEF and ITU (n.d.). Giga – Connect every school to the Internet; UNICEF and ITU (2023a). Giga Annual Report 2022; and UNICEF and ITU (2023b). Giga expands its reach to 30 countries, advancing universal school connectivity. 9 November 2023.

The global surge in digital trade offers LLDCs in Asia-Pacific a transformative opportunity for development; nonetheless, the implementation of updated economic and trade policies is imperative to overcome the barriers to full participation. Domestically, LLDCs record limited involvement in e-commerce, underscoring the need for tailored governmental initiatives to stimulate digital business activities, mirroring the proactive stance of Nepal. Furthermore, numerous LLDCs have yet to embed digital trade stipulations (DTPs) into their preferential trade agreements (PTAs), hindering the seamless facilitation of digital trade, a vital component for cross-border e-commerce.

To confront these obstacles, a comprehensive strategy emphasizing legal and technical enhancements is paramount. LLDCs can refine their regulatory frameworks by aligning with established international norms and instruments established by bodies like the United Nations Commission on International Trade Law (UNCITRAL) and the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT). This alignment fosters the harmonization of electronic trade data and document exchange regulations, thereby streamlining cross-border digital transactions. Additionally, undertaking the revision of their trade pacts to modernize existing measures and include digital components are important measures.

Moreover, capitalizing on public-private partnerships (PPPs) for technological advancements and augmenting digital foreign direct investment (FDI) are crucial for cultivating the digital economy. Policies aimed at bolstering the digital skills workforce, easing regulatory burdens on businesses through the liberalization of ownership and licensing regulations, and fostering a conducive environment for digital enterprises are imperative to attract more digital FDI. Understanding and addressing the impact of the predominance of state-owned enterprises and dependence on public investments is also

important.

Cooperation plays a crucial role in establishing digital infrastructure and utilizing digitalization for trade and investment among LLDCs. By collaborating, governments and stakeholders can streamline digital standards and regulatory frameworks, thereby reducing barriers to digital trade and investment and enhancing digital infrastructure connectivity and skills for all citizens. It is essential for such collaborations to also consider the financial sustainability and environmental impact of new ICT network infrastructure projects. The Asia-Pacific Information Superhighway (AP-IS) exemplifies such efforts, aiming to enhance regional connectivity and digital integration.² Through initiatives like the AP-IS, best practices are exchanged, and digital skills are promoted. The latest action plan, extending until 2026, serves as a regional roadmap for further cooperative endeavors in bridging the digital divide and accelerating digital transformation.

Additionally, regional and subregional cooperation present strategic opportunities for LLDCs to enhance their trade engagement. Digital trade collaboration endeavors should prioritize provisions that offer specialized assistance to micro, small, and medium-sized enterprises (MSMEs), facilitate capacity-building initiatives, and facilitate the transfer of digital technologies. These measures are crucial for fostering an inclusive digital trade environment that not only addresses immediate challenges but also contributes to long-term productivity and job creation. By ensuring compatibility across countries and integrating differential treatment between LLDCs, the region can progress towards a more integrated and inclusive digital trade framework. In particular the emergence of the "Middle Corridor" for goods transport between Asia and Europe presents numerous opportunities.

Accordingly, regional cooperation is indispensable in leveraging opportunities arising from the digital

² The AP-IS platform, a region-wide intergovernmental initiative, strives to bridge the digital gap and expedite digital evolution in the Asia Pacific region by fostering policy dialogues, mobilizing cooperation, sharing knowledge and technology, conducting research, and enhancing capacity building among member States (ESCAP, n.d.).

transformation in areas such as transport connectivity as well. The Trans-Asian Rail Network, while expanding regional partnerships, requires the development of regulatory frameworks and interoperability to maximize its potential. Harmonizing traffic management, streamlining rail business processes, and enhancing cross-border rail infrastructure and information exchange through digitalization are crucial steps in vastly improving the transportation experience. Additionally, scaling up transport multimodality, especially between the Trans-Asian Rail Network and Dry Ports, can provide competitive long-distance connections, fortifying international transport and leading to tangible economic benefits for countries across the region. By establishing themselves as reliable transport partners, LLDCs in North Central Asia in particular, can catalyze economic development, attract foreign investment, and increase global involvement, thereby leading to economic advantages for the region's countries.

5. WAY FORWARD: Vienna Programme of Action

The current Vienna Programme of Action for LLDCs, spanning from 2014 to 2024, crafted in the early 2010s, had limited emphasis on digitalization and innovation. Nonetheless, it acknowledged the pivotal role of digital infrastructure in empowering LLDCs to partake in the global digital economy. The Programme advocated for initiatives like digital bridges to ensure affordable broadband and internet services, thereby fostering digital inclusion and connectivity. It underscored the significance of partnerships between LLDCs, transit countries, development partners, and the private sector to mobilize resources and implement tailored digital solutions.

Contrastingly, the forthcoming programme of action for LLDCs, slated to be adopted in 2024, is expected to prioritize digital connectivity and transformation. The Euro-Asia regional final review of the Vienna Programme of Action highlighted digitalization as a key opportunity, particularly noting the dynamism of digital trade in services in facilitating LLDCs' international trade participation. There was a call for LLDCs to establish supportive frameworks for leveraging the digital economy, urging increased technical support from development and transit partners and UN entities.

Central to this focus is the development of both hard and soft ICT infrastructure, accompanied by legal frameworks and policies to bolster ICT advancement. Enhancing digital literacy, promoting inclusion, and fostering the adoption of ICT applications and services are critical in bridging the digital divide. These efforts are imperative for overcoming geographical and infrastructural challenges, enhancing LLDCs' competitiveness, and facilitating their integration into the global economy.

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