



Mongolia in the Digital Age



The Digital Readiness Assessment



Foreword

We are living in a historical time of the Fourth Industrial Revolution where technology is revolutionising almost every aspect of life as we know it. Like many countries, Mongolia's ICT sector has boomed in the past decade and continues to grow rapidly. While people enjoy internet coverage throughout the its vast territory and affordable internet and online public service delivery, there is a challenge that women, people living in poverty and rural communities might be left out at the other side of the digital divide.

With this report, we aim to evaluate the current readiness of the country in terms of ICT and technology including the digital divide and social inclusion. From there on, we develop the Strategy Primer as part of the toolkit to guide the nation to more inclusive digital economy and inclusive society. We have been very proud to work with Pathways for Prosperity Commission on Technology and Inclusive Development and the Government of Mongolia.

The Government of Mongolia aims to be more adaptive to new frontier technologies and ensuring that key economic actors are pulling in the same direction to inclusive digital economy. While we are aware of unintended consequences or risks that may come with the advanced technology, we are truly optimistic that Mongolia will benefit from the technological development to solve some of the problems while keeping their authentic nomadic culture.

Acknowledgement

The Government of Mongolia and co-chairs and commissioners of the commission would like to extend their thanks and acknowledge the dedicated people who made this report possible. This project is co-owned and hosted by his excellency Khurelsukh Ukhnaa, Prime Minister of Mongolia and under the supervision of Oyun-Erdene Luvsannamsrai, Cabinet Secretariat of the Government of Mongolia.

This report would have not been possible without our sponsor United Nations Economic and Social Commission for Asia and Pacific. We would like to thank Ms. Marta Pérez Cusó who not only supported our work but showed technical assistance on the report.

It was drafted by the local implementation partner, Access Solutions team which was led by Bolor-Erdene Battsengel and the Commission's team led by Professor Stefan Dercon and Professor Benno Ndulu and the secretariat's head of research and policy. Invaluable contributions to this report were made by research and policy team, Toby Phillips and Tebello Qhotsokoane and the head of the communications Meena Bhandari.

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About the Pathways Commission

The Pathways for Prosperity Commission on Technology and Inclusive Development is proud to work with a talented and diverse group of commissioners who are global leaders from the government, the private sector and academia.

New technologies are radically transforming lives across the world in ways that would have been difficult to imagine even a few years ago. The [Pathways for Prosperity Commission](#) – co-chaired by philanthropist Melinda Gates, Indonesian Finance Minister H.E. Sri Mulyani Indrawati and Econet CEO Strive Masiyiwa - has sought to shift the digital technology discourse away from fear of job destruction, which has paralysed many decision-makers, and towards a more practical discussion on how developing countries should prepare to forge new tech-enabled pathways to inclusive growth. While each country will (and should) determine its own approach to development in the digital age, it is clear from our consultations that policymakers would welcome operational guidance on the issues and decisions they are facing.

The Pathways for Prosperity Commission is therefore prepared a policy toolkit, which seeks to catalyse in-country processes to identify national opportunities and imperatives, from which a country strategy for inclusive growth in the digital age can be developed. The toolkit aims to help developing countries (i) self-assess their present state of digital readiness; (ii) structure national dialogue on trade-offs inherent in laying stronger digital foundations and (iii) trigger the development of operational plans to accelerate the country's preparation for harnessing technology to achieve inclusive growth.

The Government of Mongolia has the full ownership of the project and hosted the prototype toolkit in Mongolia. The toolkit was trialed through **a process rooted in Mongolia**, which was result in a primer strategy of real practical use, and which was able to stimulate better conversations, better planning and ultimately better outcomes. Access Solutions LLC implemented the project under the leadership of the Communications and Information Technology Authority and liaised between the government, the Commission, and local implementing partners involved in the pilot.

INTRODUCTION

Mongolia, one of the most sparsely populated countries with a rich history and nomadic culture, has been challenged to accelerate its economic and social development in the age of information technology and digitalization. Mongolia has a potential to harness the new wave of frontier technologies and chart new pathways for prosperity. By bringing their nomadic communities closer to technological development, and wiring the nation to be digitally connected, Mongolia can create an inclusive and vibrant digital economy.

Over the last 10 years, information technology goods and services have boomed, and Mongolia's young and adaptable population has embraced IT products for personal and professional uses. Disruptive technologies, including artificial intelligence, blockchain, and advanced data analytics, have already been introduced to Mongolia. Entrepreneurship and start-up culture have become popular among the younger generation, who are utilising these technologies to solve problems faced by Mongolians in areas ranging from financial inclusion, to education and health.

While rapidly advancing technology and digitalization is helping people in every corner of Mongolia to stay connected and be financially included, there are a number of significant risks as well. Digital divides across geographies and urban poverty arising from migration to the ger district are already causing digital exclusion. Furthermore, the absence of fit-for-purpose regulation, and low levels of information and digital literacy may undermine consumer trust in digital tools, limiting usage.

In order to define Mongolia's readiness to capture digital opportunities and solve development challenges, it is important to address the gaps in the core enablers of inclusive digital economies. This report diagnoses the gap in the development of these core enablers as well as emerging issues affecting digital readiness in the country by analysing these core enablers and looking at specific drivers of and barriers to technology adoption resulting from gaps in unlocking these enablers.

The readiness condition of Mongolia's digital economy is diagnosed by four foundational enablers namely digital infrastructure, human capital, access to finance and the policy and regulatory environment. A baseline assessment of Mongolia's position vis a vis these foundations of a digital economy will allow stakeholders to set a clear plan for public investment and development planning, as the country prioritises inclusive digital economies as its development strategy.

DIGITAL OPPORTUNITIES



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Digitalization is a new reality on a global scale. Mongolia as a developing country ought to grasp many of the opportunities brought by such rapid changes and use digitalization as an accelerator of development. In this part, we aim to identify feasible digital opportunities that could create employment, diversify Mongolia's economy and drive productivity and efficiency in the economy.

Narrowing the social inequality gaps

According to the statistics from the NSO, Mongolian women earn 19.6% less than men in a same position in 2019. Women are also often engaged in less paid professions and irrespective of their individual competencies, women tend to occupy lower ranks than men in the job hierarchy both in the public and private sectors. To add to the challenge, Mongolian women two times more time on household and care duties than their male counterparts, resulting in worse economic outcomes for them.

Mongolia also has differences in educational outcomes between students from rural and urban schools, public and private school, and schools in the central district of Ulaanbaatar and those in the ger district. According to the Educational Evaluation Center of Mongolia students who study in the central district scored at least 60 points (out of the total score of 800) more than the students studying in schools in ger district in 2018, While students from private schools earned 74 scores better than the students from the public school of Ulaanbaatar. This disparity gets even bigger between the students from rural and urban areas.

Digital technologies present Mongolia with unique opportunities to narrow social inequality across geography, gender and income. Smart adoption of digital technologies in health and education has shown great efficacy in countries such as India and Malawi. Mongolia could replicate leverage similar technologies to close achievement gaps in education and improve health outcomes across regions and income levels.

Digital platforms also provide opportunities for income generation to the poor and unemployed, especially women. These platforms could provide an opportunity for gaining income, skills upgrading, greater connection to the formal economy, thereby reducing income inequality. These opportunities for 'gig work' could provide women with more flexible work arrangements, allowing them to participate in the work while performing home care duties, giving them greater agency and control as a result.



Sumiyajav.S,

MIT student

Access to quality education makes Mongolian youth to become competitive in global market. Sumiyajav.S, a student from Galt soum of Khuvsgul aimag, has been admitted to study computer science in MIT that tops the rankings of world's leading universities. Despite of poor-quality formal education, he has attended various MOOC's and improved his English and digital skills. In one word, his achievement was a result of accessibility to online education.

Contributing to the Global IT Development

Mongolia also has the potential to contribute to the development of the global technology development with its young population. The outsourcing sector can be a huge economic driver, especially because it could create employment opportunities for young Mongolians who are the largest unemployment group. 38 percent of the working age population are not participating in the job market and a half of them are young between 18 to 24 ages. ICT outsourcing demand is rising because developed economies lack qualified and experienced IT staff willing to work in the ICT field. The relatively lower wages in Mongolia present the country with a comparative advantage to serve markets in Japan, China, Russia and North American markets, creating employment opportunities for the young and skilled workforce.



DENTSU DATA ARTIST MONGOL

Success stories of Mongolian engineers are spreading that become crucial part of BPO in multinational companies. For example: A Japan-based AI company "Data Artist" set up a operation in Ulan Bator in Mongolia and **recruited 400 talents who will work remotely to contribute AI development**. Data artist has the proven record of recruiting Mathematical Olympiad's Mongolia medalists and finalists who immediately demonstrated their capabilities and contributed to Data Artist's business success as an AI technologist.



Another insightful case belongs to NEST Academy, an initiative to prepare **competitive software developers from their young age** in high school and place them to international market. They aim to establish solid foundation to empower future generation of Mongolia and to practice ten thousand of high-school students with advanced digital skills, whoever are ready to contribute to the global demand in tech talents.

Mongolia is a potential location for outsourcing because of its proximity to digital hubs in Russia and East Asia, and the relatively low cost, highly motivated and dynamic IT professionals with strong mathematical skills, a prerequisite for the development of AI. The Quality of Math and Science education in Mongolia is one of the best in Asia Pacific.

Digital technology adoption in core economic sectors

"IT sector in Mongolia is ready to support the core economic sectors to have better use of high technologies. The only inconsistency is that the domesticating process of such technologies in agriculture, mining and other sectors is slower than the IT sector's capacity" Bilegdemberel Badamdorj, Director of IT Policy Planning Department

In order to create a multi-sector balanced economy, Mongolia has started using not only IT but also frontier technologies to support other economic main sectors. For example: Agriculture, as the second biggest sector in terms of economic output and the most labour-intensive sector in Mongolia, has started using the benefits brought by technological advances on registering livestock and creating an animal gene bank and a monitoring Standard Operating Procedure (SOP) to monitor animal health. As the economic growth rate declined suddenly by the decrease in mining prices, agriculture and processing were noticed as the main industries to provide diversification.

The agriculture sector needs more sustainable production and supply system throughout the year, including in the winter months, as well as improvements in productivity. Currently, livestock processing and distribution, low level of processing technology, insufficient distribution channels, and market information asymmetry still remain as major challenges that hinder stable value chains and productivity.

Technological advance is creating all sorts of new possibilities for agriculture. By utilizing the IoT and AI to collect and analyze data from their farming practices and the surrounding environment, agricultural productivity can be improved even in areas with

limited access to water. This technology is expected to bring a huge change to the future of sustainable agriculture.

GPS, autonomous vehicles, and software could enable smart agriculture and agronomics which ensures less seed, fertilizer, and fuel are wasted thereby lowering costs and ensures efficiency in agriculture. Remote sensors could also help agriculture by enabling real-time traceability and diagnosis of crop, livestock and farm machine states. This enables precise forecasting of the expected crop production and yield over a given area, so that Mongolian farmers would have the necessary data to improve their operations. The application of innovative ways to use information and communication technologies will help alleviate information asymmetries, thus enabling small and medium-size farmers to actively participate in the market without paying high middleman charges.

In one word, using and adapting digital technologies will help make agriculture sector in Mongolia more sustainable and efficient in the near future. Adapting to these changes requires a rapid transformation of all segments of the agricultural supply chain. Decision-makers who are not aware of these institutional changes and technological opportunities — and do not have the information systems that monitor them — will slow economic development¹.

Tourism sector as a diversification opportunity to Mongolian economy, is expected to contribute more than US\$2bn by 2028 (up from US\$1.23bn in 2017) to country GDP². As the neighboring markets like China, Russia, South Korea and Japan, outbound trips are on the rise, Mongolia needs to capture such regional flows of travelers.

Use of data and information technology in this sector is tremendous that at least all tour operators, entertainment centers, museums and historical sites, hotels, and transportations can utilize digital tools to offer the best experience to travelers. Digital technologies facilitate increased customization of traveler experience and enhance customer satisfaction. In order to do so, Mongolia is better to become an internet-friendly country in a way all locations information of the tourism destinations can be found and supporting contents including tourist services and other necessary information can be found on internet in English.

On the other hand, digitalization presents opportunities for SMEs to expand their market reach, increase growth and improve operational efficiencies. In 2018, there were 72,648 small and medium size tourist camps, resorts, ger camps and other accommodation providers in Mongolia³, The tourism industry in Mongolia is highly fragmented and subsectors such as transport, accommodation, catering and other services are all subject to different opportunities by using digitalization.

Developing a complex ecosystem for tourism to upgrade cultural resources and the identity of local people can be a resource for attracting visitors, the incentive to preserve cultural heritage.

Finally, Mongolia could also further improve productivity in the mining sector by digitizing various processes and pushing for the better technology adoption and innovation in the sector. In an ideation session with Energy Resources LLC, a Mongolian mining corporation, challenges associated with truck servicing, export permit applications, and inefficient distribution channels were highlighted as areas where digitization and technology use could provide quick wins and boost productivity. New technologies in such autonomous vehicles, remote operating centers, automated drilling and tunnel boring systems, machine learning and more are going to fundamentally change the way that the mining sector operates, greatly improving safety and productivity, and improving gender participation and environmental sustainability in mining. These new changes are likely to affect employment in mining at the lower end of the skills distribution, but could create jobs in the areas at slightly higher end of the distribution. Proactive government and private sector planning will be critical to Mongolia's ability to leverage the promise of digital connectivity, while managing some of the risks associated with digital transformation, especially for those who may be left behind.

A nighttime aerial view of a city with numerous lit-up buildings and streets. A large, semi-transparent pink rectangular overlay covers the upper right portion of the image, containing the title text. The background shows a dense urban area with various building heights and colors of light, including warm yellows and oranges from streetlights and cooler blues and greens from some building lights. The sky is dark with a hint of twilight.

DIGITAL ACCESSIBILITY AS THE FIRST STEP

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Mongolia is a resource-rich developing economy with unique geo-economic location between two giant neighbours in Central Asia, connecting the Eurasian territories. Mongolia's geographic isolation, its vast and sparsely populated land area, and its landlocked position between the People's Republic of China (PRC) and Russia pose challenges to economic diversification. These geographic challenges are exacerbated by poor infrastructure, which makes transportation costs high and Mongolia's non-mining exports uncompetitive. Infrastructure has always been the main concern of the Government and is considered the basis of sustainable economic development.

For the last three decades, public investment, mostly provided by international donor organizations, was poured into Mongolian infrastructure development. However, it has not been sufficient to provide full connectivity in the country, especially its rural areas. The following section serves as an assessment of infrastructure readiness in Mongolia. In it, we examine the gaps in access to digital infrastructure and affordability of digital products and services for different user groups.

Electricity Infrastructure

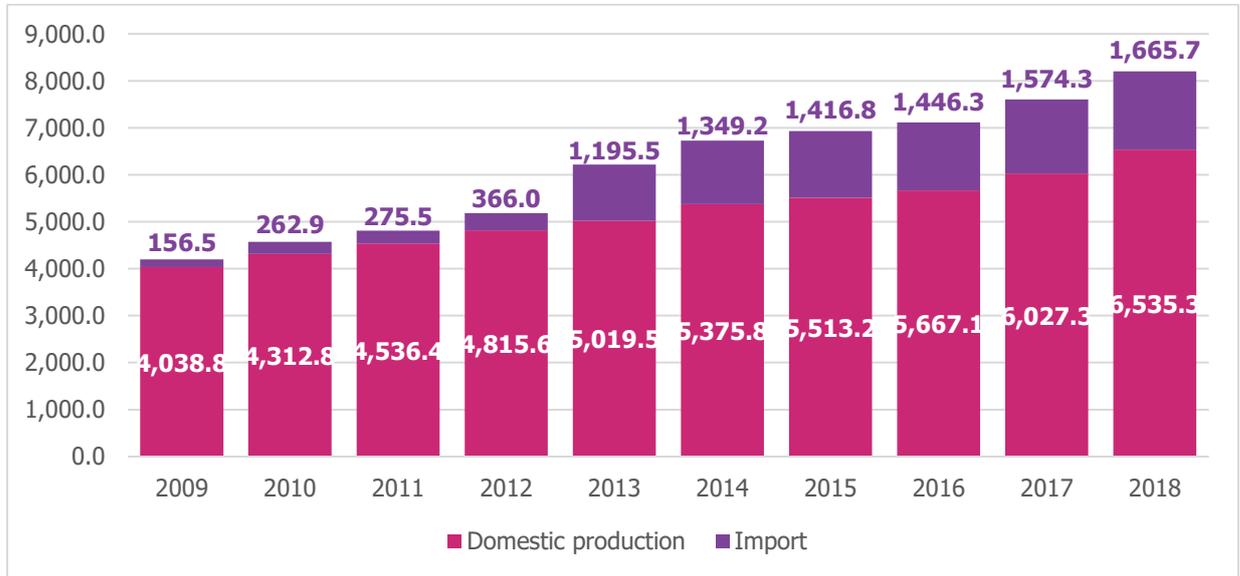
"The electricity landscape is a prime example of the Fourth Industrial Revolution as it undergoes transformation, becoming more complex than ever before, with rapidly evolving technologies, emerging innovative business models and shifting regulatory landscapes" (WEF, 2017).

Electricity infrastructure, as the skeleton of digital transformation, has been a challenge for Mongolia given its traditional nomadic lifestyle, harsh weather conditions, and sparsely distributed populations in vast territory. It is costly and formidable to provide electricity infrastructure to each family or county in remote areas, but to date, 80 percent of the total population have connected to centralized electricity system. The remaining 20 percent, who are herders living far from the aimag (province) or soum (villages) centres, have limited electricity access⁴.

Nomadic herders commonly use low-voltage, portable solar panels, and automobile batteries to generate electricity for household use. Given the socio-cultural and economic factors, such home-based system is the most suitable option to provide electricity access for people living in remote areas. "The 100,000 Solar Ger" program initiated by the Government of Mongolia in 2001 has enabled 104,000 rural households to use Solar Home Systems. It was sold to herders at a discounted price on Government subsidy. Although, solar home systems afford basic electricity access, it cannot support high voltage electronic devices such as a refrigerator, stoves, etc.

Currently, 304 out of 331 administrative units have been connected to the central electricity system, where most of the consumption occurs. 12 out of remaining 27 soums are provided by renewable energy resources, and 13 border soums are connected to electricity systems of neighbouring countries of China and Russia.

Figure 1. Electricity supply, GWH



Source: Ministry of Energy

Mongolian aim to become a self-sufficient electricity user by 2023 and it will be realistic only if the Government accelerates its current project to build new coal power plants and hydro stations. Prolonging the new energy projects is a drawback for Mongolian energy sector and the Government must address this concern by exploring more funding opportunities and bringing in with potential foreign investors.

Electricity generation can be categorized in three sources, namely coal-powered plants, renewables, and imports. Government plans to decline electricity import from Russia and expects to replace it by domestic production in the next five years.

Table 1. Current situation of energy generation

Electricity generation Share in electricity mix			National target
1	Coal-fired plants	80%-90%	To increase current production capacity in line with electricity demand growth
2	Renewables	4%-5%	To increase to 30% by 2030
3	Import from Russia	5%-15%	To decrease to 0 and to become a self-sufficient electricity user by 2023

However, imports from Russia is consequently increasing in the electricity mix due to electricity demand fluctuations in the mining industry. For example: Russian import was 4.7 percent of the total electricity consumption in 2010, but it was increased to 20.3 percent in 2015⁵. Moreover, it is expected that mining developments would increase electricity demand in Mongolia. Southern regions, where the major mining sites are based, will be in huge demand of electricity in the future.

“State policy on Energy 2015-2030” is the main development outlook of energy sector in Mongolia and it emphasizes three core areas including energy safety, energy efficiency, and environmental impacts of energy. Within the framework of this document, Mongolia is planning to increase the production share of renewables. According to the Law on Renewable Energy, approved in 2007, the government should attract more private investment compared to other sources such as coal plants.

One of the core pillars of SDGs 2030 in energy sector is the development of renewable energy. The corresponding targets are shown below. Currently, the share of renewable energy in overall installed energy capacity is 7.5%.

Table 2. Energy sector goals (SDG)

SDG goals	2016-2020	2021-2025	2026-2030
% of energy to be supplied by domestic production	85	90	100
Share of renewable energy in total energy production	20	25	30

Source: SDG 2030 Mongolia

On 31 January 2008, Mongolia adopted the Millennium Development Goals to create the Comprehensive National Development Strategy, which was implemented in two phases: 2007-2015 and 2015-2021. The following are the energy sector goals included in the long-term policy:

Table 3. Energy sector assessment

Strategic objectives	Implementation phase	Implementation Assessment
Strategic objective 5.3.2.1. To establish “ Integrated energy system ” of Mongolia, to upgrade the energy sector efficiency level and to create favourable development. Energy sector will have the capacity to export energy.	2017-2015	70
Strategic objective 5.3.2.2. To improve electricity supply of soums, urban settlements for herders	2007-2021	90
Strategic objective 5.3.3.1. To start gasification of coal and supply fuel to small-scale power stations.	2007-2015	30

Source: Green Economy Policy Assessment Mongolia 2018

Given the centrality of energy to a digital economy and the unique challenges for environment that are of critical consideration in the country, stakeholders in Mongolia should find smart solutions and financing schemes for green technologies for universal electrification while reducing the reliance on non-renewable energy sources.

Digital Infrastructure: Affordability and Accessibility

Geography plays a vital role in digital inclusion in Mongolia. Statistical data reveals significant differences in digital infrastructure and internet connectedness between rural and urban areas. For instance, 38% of the households with electricity access in Ulaanbaatar were connected to fixed broadband as of 2016, but this number was only 7% among the countryside households⁶.

Table 4. Some sectoral indicators (per 100 people)

Indicators	2014	2015	2016	2017
1 Mobile subscribers (per 100 people)	101.0	100.3	109.3	122.3
2 Internet users with fixed line (per 100 people)	11.1	13.8	14.7	13.2
3 Network coverage 4G (per 100 people)	n/a	n/a	6.9	12
4 Network coverage 3G (per 100 people)	83.75	90.3	95	95
5 Percentage of smartphone users (per 100 people)	n/a	63.0	75.5	76.8

Source: Communications and Information Technology Authority

Mongolia has a huge potential to develop digital strategies based on its core sectoral advantages including mobile subscriptions and mobile-broadband subscriptions, which are comparatively higher than the world average and Asia and Pacific⁷. After introducing 4G in 2015, penetration has been increasing rapidly for the last 2 years.

On the other hand, fixed broadband subscriptions, percentage of households with internet access, and percentage of individuals using internet have lagged behind the world average because of the geographic, economic, and social factors.

According to the International Telecommunication Union (ITU), Mongolia is ranked 14th in its region of Asia and Pacific and 91st globally out of 157 countries in 2017 by its ICT sector development⁸. ITU indicated that main advantages of Mongolia in terms of digital access are high numbers of mobile-cellular subscriptions and active mobile-broadband subscriptions. Compared to countries where digital infrastructure is well-developed (Table 5), Mongolia is almost on the same level of mobile usage. Thus, accessing the internet through mobile might be a convenient way for populations in rural areas, where fixed ICT infrastructure is rarely available.

Table 5. ICT access in 2018

	Fixed-telephone subscriptions per 100 inhabitants	Mobile-cellular telephone subscriptions per 100 inhabitants	Fixed broadband subscriptions per 100 inhabitants	Percentage of households with computer	Percentage of households with Internet access
Mongolia	11.7	133.2	6.7	36.4	23
South Korea	50.6	129.7	37.9	72.4	99.5
Kazakhstan	18.3	142	12.4	78.5	87.6
Canada	37.5	89.2	35.2	88.2	91.2
Estonia	26.1	145.4	28.2	86.9	90.5

Source: ITU

More than one million Mongolians access the internet solely through a mobile connection, which means they have a mobile phone or mobile broadband device with a data allowance, but no fixed connection. Mobile-only use is linked with socio-economic factors: people in the lowest household income, those with low levels of education, the unemployed and rural herders are more likely to be mobile-only. To compensate for the lack of rural connectedness, Mongolians can use mobile phones as they have proven to be an effective means of access to ICTs. However, this requires reducing the cost of smartphones and to drive down data costs.

Mongolia is performing better than two thirds of the world economy in terms of affordable mobile-internet access⁹. Moreover, affordability targets¹⁰ set by the UN Broadband Commission and Alliance for Affordable Internet¹¹ have been fulfilled, while an average

of 2.34 percent of monthly gross national income per capita is spent on internet access using mobile broadband for 1 GB (shown in table 5), and an average 1.85 percent of monthly income per household is used for broadband internet with 1mbps speed.

Table 6. Mobile broadband pricing 2018 Q4 (monthly)

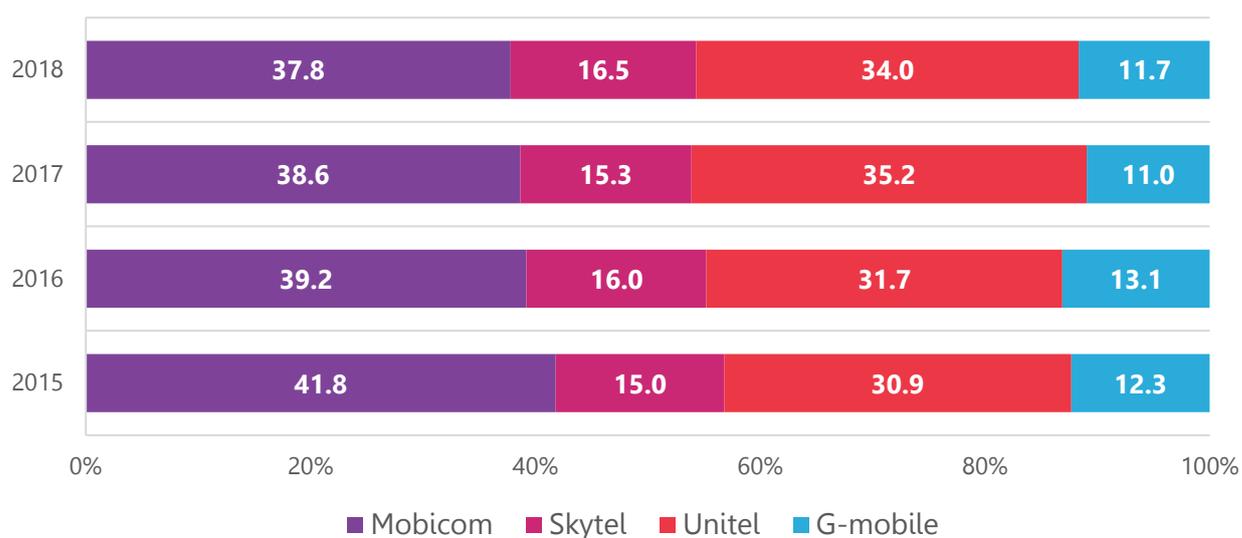
	100MB	500MB	1GB	2GB	5GB	10GB
Price USD	6.42	6.42	6.42	6.42	11.66	11.66
% of GNI per capita	2.34	2.34	2.34	2.34	4.25	4.25

Source: Alliance for affordable internet <https://a4ai.org/>

In addition, affordability has improved marginally in the last few years. While value for money spent on internet services has improved, expenditure on these services has increased faster than increases in household income due to abrupt domestic currency depreciation.

Even though it seems that there is a full competition in the Mobile¹², IMT and internet service market as the regulatory environment seem to be friendly for new entrants, the existing companies including Mobicom, Skytel, Unitel and G-Mobile do not seem to compete with the prices as they offer similar prices for mobile and internet service to customers. As we see, market concentration level (shown in Figure 2) of each market is considerably high. There is a regulation that requires existing mobile network operators to sell their access to virtual operators on similar condition. But there is no active request registered in CITA to enter mobile market.

Figure 2. Market share mobile subscribers



Source: White Paper 2018. CITA

Mongolian ICT sector is run by the four major mobile phone service operators. Mobicom is the eldest operator; then, after 10 years, Unitel entered the market and a new

competition was introduced as Unitel brought marketing to the next level which then helped them to succeed. Unitel seems to have invested heavily on marketing rather than introducing new innovative products. In fact, they do not have a Research and Development division which regularly work on innovation, but they do occasional research work.

Internet access is adequately diversified in urban areas, as the urban population benefits from plenty of options such as mobile data, mobile broadband, fixed broadband, etc. Costs of each means vary by its usage, and having internet is affordable for half of the population. However, in rural areas, there is not enough diversity in lower cost offerings and means of connections.

In order to reduce the accessibility gap between urban and rural, the government subsidize rural connectivity initiatives within the framework of a Universal Service Fund (USF). The USF finances infrastructure building projects for rural areas, especially to provide public and private internet connection with the speed of 128 Kbps/512 Kbps to soum areas.

While having improved affordability and accessibility of internet usage, digital divide in accessibility and affordability is rising in Mongolia as an inevitable policy challenge for the Government. Below, possible dimensions of a digital divide in Mongolia are illustrated.

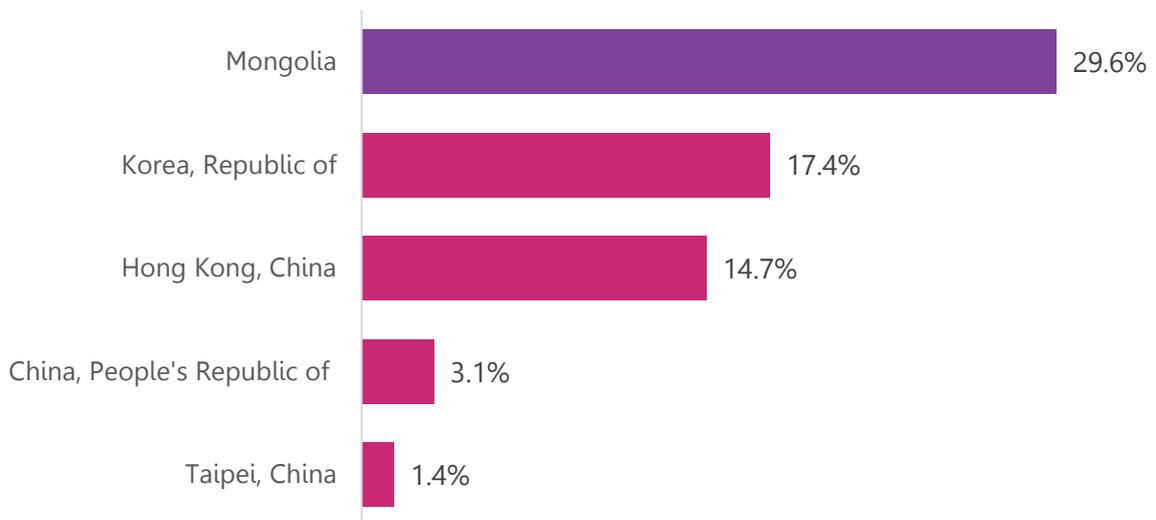
Picture 1. Digital divide in terms of affordability and accessibility



Source: All data included above is based on National Statistics Office

In Mongolia, people living under national level of poverty level was estimated 29.4 percent of the population in 2017. It means the gaps exist in affordability of internet usage. Statistics state that one of out of every three people in Mongolia is not financially stable to afford internet and smart devices. Based on the differences in statistical sources, the level of informal economy must be also considered to reach such conclusions. There is no gender discrepancy observed among poverty group, but the 38.1 percent out of people under national poverty line are children.

FIGURE 3. SHARE OF POPULATION BELOW THE NATIONAL POVERTY LINE



Source: Asian Development Bank. Basic Statistics 2019

When affordability falls, it will have a negative effect on the digital inclusion of Mongolians on lower incomes because they have less discretionary income to spend. Nomadic herders living in rural areas have a low level of digital inclusion and spend a greater portion of their household income on internet connectivity than urban population.

Soft Digital Infrastructure

More than 10 years ago, the Government initiated a plan to leap forward to an electronic ID system that facilitates public services and reduces administrative costs. In 2012, the digital ID card was distributed among all citizens as a part of secure identification and it includes an embedded microprocessor containing all personal data with biometric facial and fingerprint ID systems linked to a secure database serving Government agencies such as the electoral authority, tax, customs, foreign passport, and military agencies. In comparison with countries such as Malaysia, South Korea who has already started the implementation process of digital ID systems in early 2000's, Mongolia is pushing forward to identify every citizens and digital reforms in government service, banking, and taxation are ongoing.



Based on advantages of electronic ID card, the Government introduced the authentication service to be provided by electronic machines located in various spots in cities including Ulaanbaatar, Erdenet and Darkhan. These machines offer 19 types of public service documents published with QR codes presenting the state authentication including documents such as ID reference, birth and marriage certificate, address authentication, and property registry etc¹³. A range of 2000 to 3500 customers per day on weekdays and 530 to 760 customers on weekends benefit from such facilitated public service¹⁴. Also, the electronic ID card is used for non-Government services such as telecommunication and banks; every bank and telecom operator in Mongolia recognizes digital identification.

Another major achievement of Mongolia in terms of soft digital infrastructure is the digital signature introduced in the banking sector. The project on digitizing financial services in Mongolia introduced digital signature system under the launch of Digital Payment campaign, running between October 10 and December 10, 2018. Technological development in the banking sector allows it to fulfil the objective of delivering simpler, faster, and more secure financial services to customers. Major banks compete with innovative mobile applications that simplify daily transactions and other banking operations. Over 70 percent of consumers use mobile applications daily¹⁵. However, online banking is challenged because in some cases, a customer's e-signature is not qualified for loans.

Furthermore, the modernization of the Tax Information System has been successfully implemented. The VAT-refund electronic system (E-BARIMT) has helped the government to increase tax contribution from the black or informal economy. Over nine hundred thousand people have registered in E-BARIMT application and it is almost 56 percent of the total population above the age of 18. Provided that Mongolia made a considerable progress in terms of ease of doing business (index by the World Bank Group), paying tax in Mongolia is especially of ease, placing the country at 61st worldwide, before Japan and China.



HUMAN CAPITAL AND DIGITAL LITERACY

HUMAN CAPITAL AND DIGITAL LITERACY

Demographic indicators show that Mongolia has a balanced sex ratio¹⁶ and is dominated by youth and children¹⁷ with 63 percent of the total population being under 35. Birth-rate was increased by 5 percent due to enhanced living standards in the last 5 years. Children accounted for about 1/3 of the Mongolian populations in 2018 and there is a tendency for this portion to increase. The increase in youthful population in Mongolia will create pressure for job creation and skills development for the government and private sector.

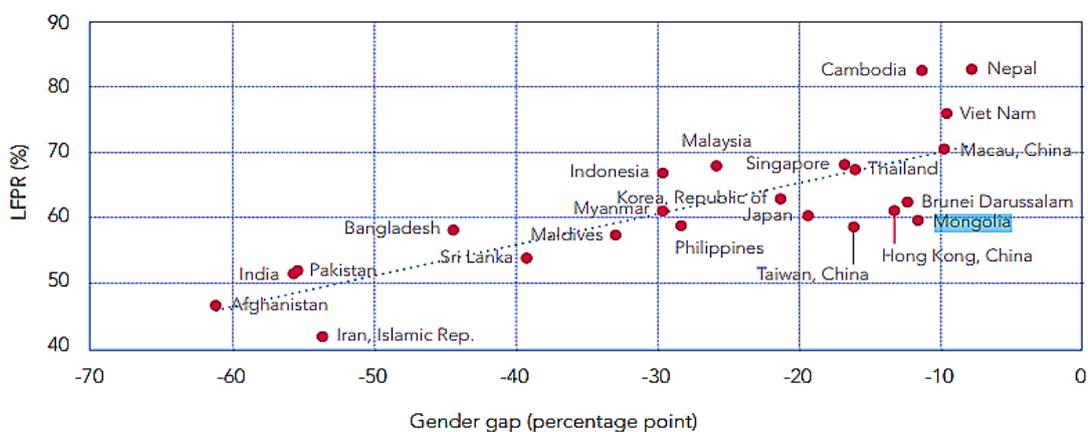
Mongolian education attainment is high, and the literacy & numeracy rate is ranked 11th in the world. According to the main indicators of human development by Global Human Capital Report, Mongolia has an average of 13.6 years of studying from elementary to tertiary and is estimated at 98.0 percent in Adult Literacy Rate in each age group from 15 to 64¹⁸. The only backward pattern is observed in the age group above 70 with 92.7 percent being literate. In addition, Mongolia is ranked 56th in the world¹⁹ for the Quality of Math and Science Education which are critical for development or adaptation of frontier technologies powered by machine learning and data analytics.

Labour Market and Youth Employment

Labour market dynamics

According to the Executive Opinion Survey 2018²⁰, Mongolia is ranked 68th globally in “Labour market efficiency” and 111th on “Know-How”²¹ in employment. Mongolia is 10th in labour force participation rate and 5th in gender gap in labour force participation in Asia-Pacific region. Compared to most countries in the East Asia and Pacific Region, gender disparities in Mongolia are relatively muted.

Figure 4. Labour force participation rates and gender gaps, available countries and economies in the Asia-pacific region, latest years



Source: ILO. Asia-Pacific Employment and Social Outlook 2018

Mongolia has a working age population of over 2 million people, out of which 61.0 percent is participating in the labour market. Currently, the unemployment rate (people actively seeking jobs) is 7.8 percent and this number fluctuates depending on the mining sector development, resulting in frequent seasonal unemployment.

Table 7. Executive opinion survey indicators of Mongolia

Indicators, 1-7 (best)	2018	Global Rank
Labour market efficiency	4.23	68
Flexibility of wage determination	5.91	12
Redundancy costs, weeks of salary*	8.67	24
Women in labour force, ratio to men*	0.84	57
Hiring and firing practices	3.74	68
Cooperation in labour-employer relations	4.24	81
Reliance on professional management	3.74	100
Pay and productivity	3.52	102
Country capacity to attract talent	2.55	110
Effect of taxation on incentives to work	3.13	114
Country capacity to retain talent	2.42	127

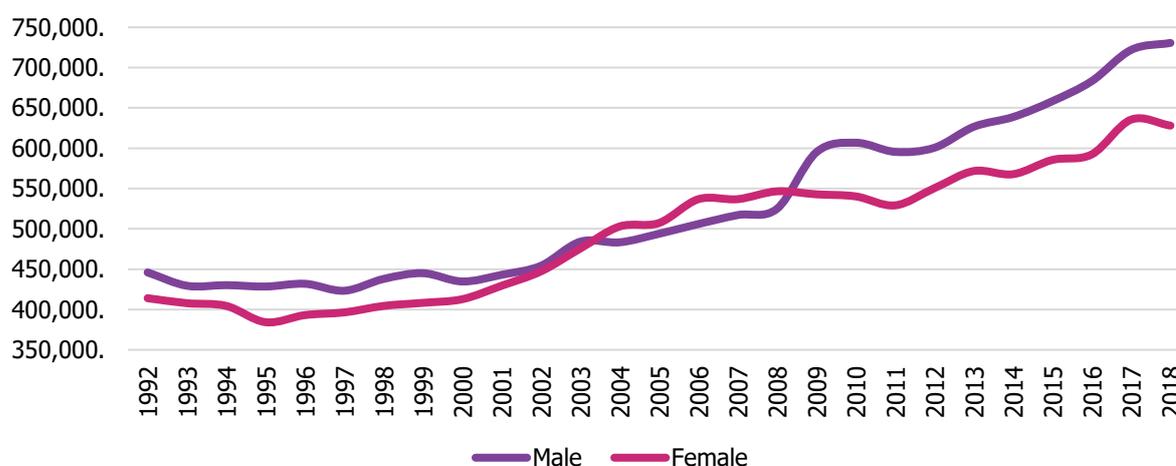
Source: WEF. Global Competitiveness Report 2018

Mongolia is ranked 68th by Global Competitiveness Index 2018, in the category of labour market efficiency. Flexibility of wage determination, redundancy costs, and gender ratio is comparatively higher than the world average and other developing countries. Hence, the lowest indicators are productivity, employee-employer relations, and country's capacity to attract talent. As for know-how, highly skilled employment share is low, and availability of skilled employees is a critical concern.

Labour force composition

About half of the employees work in service industry. Agriculture has a large share of employment, accounting for 27.1% of all employment in the labour market. Between 1996 and 2015, the gender gap in labour force participation rates increased from 4.8 percent to 12.6 percent²² and the female labour participation has declined in comparison with male participation.

Figure 5. Labour force of Mongolia



Source: NSO 2018

Men work predominantly in machinery and construction, while women predominantly work in service and sales. Young women often have lower wages and higher levels of occupational segregation than young men. Rural young men are more likely to enter the labour market at early ages, thus facing a long-term trajectory of informal and low-paid jobs²³.

Youth unemployment and informality

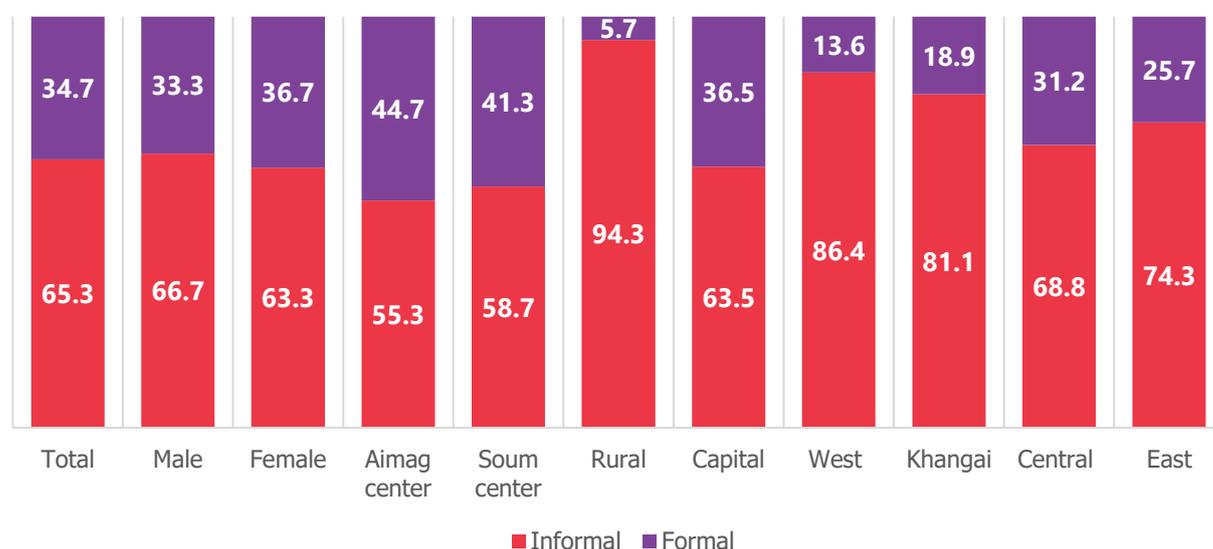
About 56.1% of the total unemployed people in Mongolia are youth between 18 to 35 years old. Many young Mongolians experience a lengthy period of unemployment before finding a job and this period is over 12 months in most cases²⁴. When jobs are available, they are usually underpaid, resulting in brain drain of middle-skilled laborers and some portion of skilled laborers who immigrate to countries with better working conditions and higher wages, like South Korea and Japan.

Young people who do work are often concentrated in the informal economy, especially in rural areas. In aimags and soums outside Ulaanbaatar, only 6% of working youth hold jobs in the formal economy. The rest usually work in animal husbandry (68%) or in non-wage family jobs (20%), where conditions are poor and prospects for upward mobility and escape from poverty are very limited. The other end of the job quality spectrum is youth in the capital Ulaanbaatar city centre, where three-quarters of employed youth enjoy high wage jobs and almost two-thirds hold jobs in the formal economy.

Therefore, creating alternative livelihood opportunities through local economic development processes, youth entrepreneurship programs, and other means is an especially important policy priority for rural youth. Promoting digital inclusion and access to finance in support of emerging start-ups might be one solution to youth unemployment. For those who work informally in animal husbandry and non-wage family

jobs in rural area have a greater risk to retain from digital inclusion. Undertaking specific digital-skill building programs for the better utilization of digital technologies in animal husbandry and agriculture will help make young and skilled labour in this sector.

Figure 4. Youth employed in formal and informal economies as percentage of employed youth of 15-24 years age group, by sex and location



Source: ILO

Education and Digital Literacy

General education and training

In 2004, after a series of education sector reforms were undertaken, the education system transitioned from the 10- to a 12-year curriculum. These reforms seem to have benefited mainly a small number of schools in Ulaanbaatar and aimag centres that are already better off in terms of educational infrastructure and resources. In contrast, schools in remote rural areas are particularly disadvantaged in these dimensions. Completion of a 9-year compulsory education remains difficult, especially for disadvantaged groups such as students from poor households, herder families, and minority groups, and those with disabilities and other special needs.

The gap in education outcomes across geographies, incomes and disability greatly hampers the ability of disadvantaged groups to participate in the labour force, and may undermine attempts to realise inclusive growth in Mongolia.

While disparities in access to quality education have become more pronounced, continuous migration to Ulaanbaatar and other cities has made kindergartens and classrooms scarce, resulting in a lower gross enrolment ratio at the pre-primary level, larger class sizes, and multiple shifts at primary and secondary levels. Small class sizes and pre-primary education are associated with better learning outcomes, so the reality of

schooling conditions in the Ger district will have a marked impact on skills development for a digital age.

In terms of gender balance, school enrolment and completion are roughly equal early in the education path, but significant disparities emerge later. In the 2013–2014 academic year, the gender enrolment ratio of girls to boys was 0.96 in primary education, 0.99 in lower secondary education, 1.16 in upper secondary education, and 1.41 in higher education. The primary completion rate in the same academic year was 98.8% for girls and 97.9% for boys. The reverse gender gap in educational attainment among young adults has provoked social concerns, especially in rural areas, where more boys than girls tend to drop out to support their families in herding and other income-generating activities.

A key issue in the education system is that many graduates leave high schools, colleges and universities without skills to meet the job market demand. Universities and colleges should focus on improving curriculum and to include more comprehensive internship programs and to work in collaboration with potential employers.

Skills mismatches and digital skills development

Mongolia has a number of global startups looking to prove their concepts in Mongolia, such as Lend.mn. Despite Mongolia's business friendly environment, such companies face a barrier to entry in the form of qualified workers. While Mongolia's education system seems to be on par with peers in the Asia and Pacific region, the education and training systems have not succeeded in adequately equipping students with skills that are in high demand. The university system produces engineers who have little to no applied skills, especially on new technology, due to the siloed relationship with industry and higher education, reflected by the outdated curricula.

"It takes almost 3 years to train a new graduate to make satisfy the job requirements of our company. It is actually a direct loss for the company; thus, we are taking the initiative to implement long-term internships and other alternative programs for senior level university students who are planning to work in our company" reflected **Soyolchimeg.B, a HR manager in Mobilcom, the top Mobile operator in Mongolia.**

Additionally, there is a challenge of making a smooth school-to-work transition for seniors in secondary schools, technical and vocational education and training (TVET), and institutions of tertiary education. About 30.4% of recent graduates are incapable to accomplish job-related tasks and 24.6% lack practices and knowledge to perform work²⁵.

These gaps in practical, technical, and communication skills in recent graduates is a key challenge for economic productivity and efficiency. As a reflection of this, the employment rate of graduates from technical and vocational schools and higher institutions currently averages at just above 50%. Since 2014, the unemployment rate for youth aged 20–24 has been persistently high at around 18%, well above the national unemployment rate. Due to the lack of quality and relevance of curricula and teaching-learning methods, Mongolia’s education and training systems have resulted in skilled-labour shortages and skill mismatches.

General digital literacy

UNESCO defines digital literacy as the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technologies for employment, decent jobs, and entrepreneurship²⁶. People’s inability to develop effective information practices, which enable access to quality information, can result in a digital exclusion. There is no study done in Mongolia to identify the digital literacy level of the general population.

A study on the digital literacy practices (Daariimaa, 2016) shows that inequality in digital literacy amongst the students were directly correlated to their fluency in English and access digital technologies prior to becoming students. The inequalities associated with students’ previous schooling can be ameliorated, in part, through the provision of quality English and digital literacy education for children from all social backgrounds. They require opportunities to develop these vital literacies for their personal benefit and for academic learning in the context of the global knowledge economy. To ensure that this occurs, it is time for teachers to rethink how the subjects associated with developing such literacies are taught.

This survey reveals that the most popular use of English is related to using the internet, whereas the most popular use of digital technologies was related to learning English. While urban students, especially in Ulaanbaatar, can use free wireless internet both in their home and dormitory, rural students’ dormitories have very limited access to internet.

Regarding the language skills, Russian was a core subject until the end of 1990’s²⁷ which then changed to English from early 2000’s. From 2000 to 2010, English language was one of the foreign language options available to students at middle and high school as well as the university. English became the core subject since 2010 and is embedded in the core curriculum, but it is taught differently in urban-rural and centre-remote areas of the city due to the lack of skilled teachers as discussed in the Human Capital Dialogue session of the project. Interestingly, the statistics show the average score of the all the high school graduates is counted at 42.9% nationwide out of 100% in 2018. Therefore, there is a huge necessity to improve the English language skills especially from middle and high school.

ARCHITECTURE AND ACCESS TO FINANCE



THE ARCHITECTURE AND ACCESS TO FINANCE

According to the World Bank's "Ease of Doing Business Index 2019", Mongolia is ranked 74th globally and 10th within the group of lower-middle income economies. Particularly, the ease of getting credit²⁸ and protection of minority investors²⁹ are the key advantages of doing business in the country. In fact, Mongolia has advanced in many of the indicators as a direct and indirect impact of massive digitization initiatives by the Government such as introducing electronic information system for registry³⁰ in 2018.

A survey conducted by Mongolian Chamber of Commerce shows that Infrastructure and Technology environment is relatively good compared to other factors including political stability and socio-economic environment³¹.

Table 8. Main factors of technological environment

Indicators	Coefficient out of 7	Evaluation
Electricity usage	4.103	satisfactory
Internet usage	4.176	satisfactory
Postal service	4.133	satisfactory
Government support on new technology	2.717	unsatisfactory
High-tech penetration	2.96	unsatisfactory
Possibility to collaborate with academic and research institutions	3.202	moderate
Feasibility of patent, trademark registration process	3.317	moderate

Source: Survey Results on Mongolian Business Environment 2017, Mongolian Chamber of Commerce

Financial Inclusion

Mongolia's Sustainable Development Vision 2030 aims to establish sound development finance and a financial market ecosystem that would promote stable economic growth, increase the role of non-bank financial institutions, and stabilize financial institutions. The Mongolian financial sector is made of 14 commercial banks, 18 insurance companies, 518 registered non-bank financial institutions, and about 280 savings and credit cooperatives. Banking sector dominates the financial sector, holding 96 percent share of annual output of the financial sector.

93.8 percent of adult population hold a bank account³², placing Mongolia well above the East Asia and the Pacific region average of 70.6 percent. Around half of all bank account holders cite receiving Government payments as the most common use for a bank account. In addition, the share of adults with a mobile money account has reached 21.9 percent of the population, an increase from just 5 per cent in 2014. However, lower amounts of

savings, high-cost financial resources and lack of financial literacy among individuals need to be addressed for financial service delivery.

Financial inclusion is disparate among income groups. 87 per cent of the lowest income group has active bank accounts, which is lower than the 97 per cent in the highest income group. 49,1 percent of Mongolians use mobile banking, 27 percent use internet banking, and 43.7 percent uses neither of them. According to Financial Regulatory Commission, financial literacy in general public is not sufficient and a divide exists between urban and rural, rich and poor communities.

The financial system is not sufficiently developed to support broad-based access to finance. Commercial banks continue to dominate the financial sector. No fully licensed foreign bank operates in Mongolia, impairing competition and alternative product availability. Although SMEs make up 90% of registered businesses and provide about 50% of all jobs, up to 90% of the country's 36,800 such enterprises do not have regular access to finance from banks. This limits their chances to grow and ability to realize their potential contribution to growth and job creation.

Furthermore, their access to lending is constrained by a lack of recognized collateral, high lending rates, and banks' own liquidity constraints on long-term lending. Other constraints are an inadequate credit information base, burdensome requirements imposed on SMEs when applying for credit, their poor understanding of financial management, and underdeveloped loan underwriting capabilities at banks. Access to lending and financial services is limited in rural areas and urban areas outside the capital. Financial literacy is also weak, especially among women, and an effective regulatory framework for financial consumer and investor protection does not yet exist.

Mongolian economy needs long-term sustainable financing, which is currently a challenge to policy-makers. Banks are impaired by funding constraints to offer longer term loans. There are very limited financial market instruments available to private borrowers in the country's illiquid and inefficient bond and equity markets. There is also no effective interbank or secondary market for Government bonds. The underdeveloped primary Government bond market constrains the creation of a corporate bond market. Moreover, the small private equity sector focuses only on mining projects.

Start-Up Financing

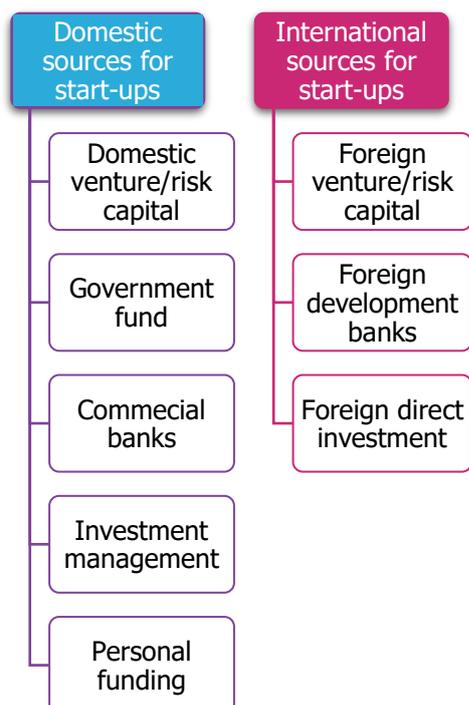
Mongolian Government has progressive outcome in terms of promoting new businesses and improving the ease of doing business in Mongolia. For example, Mongolia made starting a business easier by eliminating the requirement to get company statutes and charters notarized as well as the requirement to register a new company with the local tax office in 2014.

However, the difficulties faced by entrepreneurs in Ulaanbaatar include several that one would expect to see in any budding start-up community – accessing mentors, seed funding, expanding into foreign markets, and growing a team³³. In the last few years, the Government has committed to support funding schemes for entrepreneurs, and one of the biggest contributions was the creation of the National Information Technology Park in 2002. In 2018, the Hub Innovation Centre was established at the initiative of the Mayor of Ulaanbaatar city to promote and encourage the activities of start-ups. It has been promoting IT and innovation start-ups. Many successful IT companies benefited from the encouraging policy by the technology park to invest in R&D, register intellectual property, and develop technologies in-house. Such companies are namely “Interactive LLC”, one of the biggest corporate software providers, and “Datacom”, the top hosting company.

The investment climate for start-ups is generally quite poor. With few resources, entrepreneurs are often left alone to seek their own funding from private individuals. The lack of available capital greatly stifles the development of innovation-driven enterprises. The current ecosystem would largely benefit from a network to connect private investors with entrepreneurs as well as the creation of programs to educate entrepreneurs on how best to search for funding. By increasing knowledge about the investment climate, potential investors might be more comfortable investing in Mongolian start-ups, and Mongolian start-ups might be able to more successfully approach potential investors.

Although there are not many venture capitalists in Mongolia, which is why the Government has been trying to increase investment for start-up companies. In the State Policy on High Technology Industry (2010), the Government states its desire to support venture capital funds directed towards high technology. The implementation of this policy is left on the papers. There are also ongoing efforts to support SMEs and start-ups that are funded by both foreign development banks such as EBRD and the Mongolian Government.

PICTURE 2. NON-EXHAUSTIVE LIST FOR FUNDING SOURCES³⁴



- **Domestic venture/risk capital:** Mongolia is ranked 137/140 by venture availability (WEF 2016)
- **Government funds:** The government channels its resources through the National Information Technology Park, which provides incubator and discounted office space for start-ups
- **Commercial banks:** loan level is too high to afford for start-ups
- **Investment management:** Both domestic and foreign investors are less likely to work with a Mongolian company without a local fund manager.
- **Personal funding:** If the entrepreneur has a bullet-proof business plan and enough passion, this highly valuable.

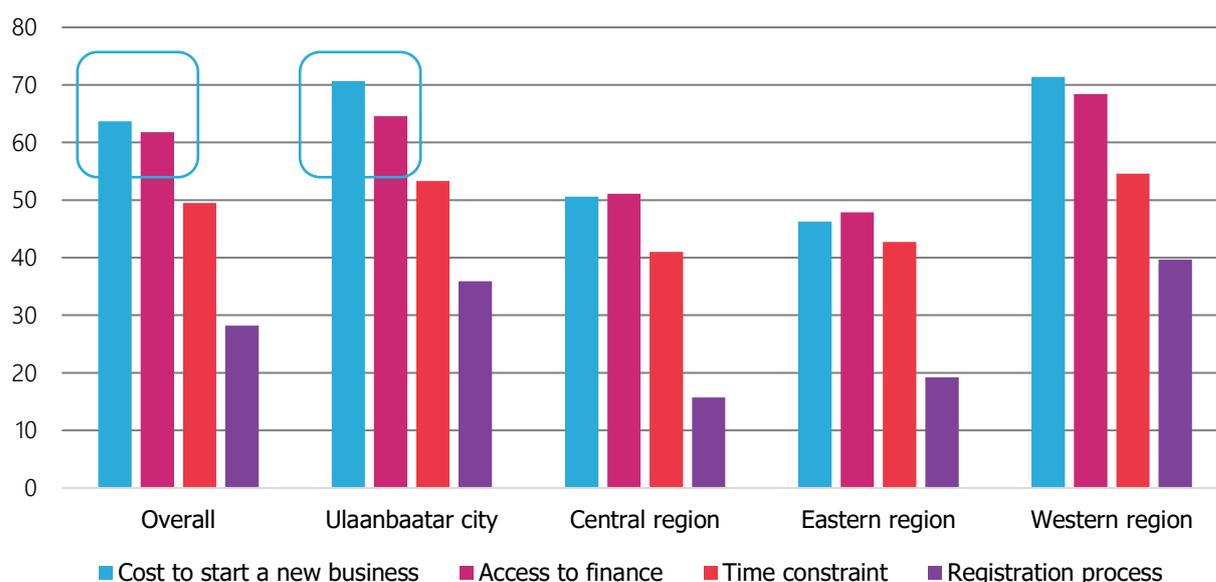
Some start-ups succeed in IPO in Mongolian Stock market, which could be another source of funding. Until now, Mongolia only has two successful cases; one is a complete IT based company I-Tools LLC, and the other one is a newly emerged fintech company LendMN. As those cases were attractive enough to hold public attention, both performed beyond expectation. For example, LendMN achieved its plan to raise MNT 5 billion from the market, half of it from strategic investors and remaining MNT 2.5 billion from the public³⁵.

A detailed survey conducted by Mongolian Chamber of Commerce defines the top constraints for start-ups in ICT sector. In the result, 60.9 percent of total surveyors named cost to start a new business as a key constraint, 57.5 percent named access to finance, and 48.7 percent named time constraint as main obstacles³⁶ for starting a new business.

Top constraining factors for start-up growth in Mongolia:

1. **Cost to start a new business**
2. **Access to finance**
3. **Time needed to start a new business**

Figure 6. Constraints for start-ups



Source: Survey Results on Mongolian Business Environment 2017, Mongolian Chamber of Commerce

It should be noted that the commercial banks in Mongolia take the initiative to support start-ups. For example, Khan Bank has a specialized Incubation Centre that offers trainings for its 400 clients that have obtained loans through the bank. The incubation centre is currently more similar to a training centre, as many of their clients are fairly established. The centre is looking to attract more early stage entrepreneurs by creating an investment fund.

Table 9. Constraints for starting a new business in Mongolia

Financial constraints	Survey result (%)	Level of constraint
Limited opportunity for financing based on financial guarantee	47.6	moderate
Less development of credit options such as ventures, angel investors	45.0	moderate
Inadequate legal protection for the borrowing entity	42.9	moderate
Low development of integrated credit information system	30.0	least
Breach of contract	31.3	least

Source: Survey Results on Mongolian Business Environment 2017, Mongolian Chamber of Commerce

Moreover, start-up businesses evaluated that financial constraints had a moderate impact on their way of doing business, and they benefit from the development of an integrated credit system and protection of minority investors. Also, further supporting policies in the field of up-to-date credit options³⁷, financial guarantee, and legal protection for borrowing entities should be enhanced for better access to finance. This finding corroborates with

the ranking of “Ease of Doing Business” for getting credit, ranked among the top 30 countries globally in 2018.

Regulatory Environment

As of 2017 Mongolia does not have significant entry or exit barriers for businesses, and the economy is highly open to foreign trade and investment. The Competition Law, passed in 2010, provides a good legal framework to address anti-competitive behaviour by firms. The Investment Law, passed in 2013, eliminates restrictions on private foreign investment and offers an array of investment incentives for both national and international investors. Mongolia has one of the least restrictive trade and capital control regimes in Asia and the Pacific region. The tax burden is also among the lowest in the world across the spectrum of taxation. There is little direct state intervention in goods markets, and few state-owned enterprises are operating. Corporate governance laws generally encourage disclosure and protection of shareholder rights. Overall, the main elements of a sound legal and regulatory framework are in place, but enforcement capacity and implementation are weak.

Competition Law

The first Law on Prohibiting Unfair Competition was passed in 1993, and on 10 June 2010, the Parliament approved the amended Law on Competition. The purpose of this Law is to provide conditions for fair market competition among entrepreneurs, to prevent and prohibit any activities that allow market domination and lessen competition, to determine the legal basis for the competition regulatory authority, and to regulate the relations among them. It should be noted that the ability for Mongolia to engage with and confront complex antitrust issues and competition cases is limited due to the lack of relevant skills and knowledge of its professionals. It is important that these capabilities are developed, given the complex antitrust and competition issues brought up by digital platforms and data-driven business models.

Intellectual Property

Mongolia has joined the World Intellectual Property Organization (WIPO) and signed and ratified most treaties and conventions, including the WTO TRIPS agreement. The WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT), collectively known as The WIPO Internet Treaties, were signed and subsequently ratified on 25 July 2002. The Intellectual Property Office of Mongolia has the administrative authority to investigate and seize fakes without court order. Of these three, the Intellectual Property Office of Mongolia makes the most consistent good faith effort to fulfil its mandate. The inability to protect intellectual property rights could affect the levels of investment in R&D, which is important for technological innovation.

Although, Mongolia has adopted the international framework for Intellectual Property protection, there are rooms for improvement especially in the field of valuation of intangible assets, and protecting digital contents. Numerous controversial cases have been raised by digital content makers and copyright owners regarding poor enforcement issues during the Dialogue sessions. The cost evaluation of intellectual works is still a problematic issue. The first side is that, in terms of legal and economic theories, there is a non-existence of studies and surveys on the cost evaluation of art and intellectual works. Secondly, in practice, the evaluation of intellectual and art works has been made on unreliable bases and the effort is at its beginning stage.

Consumer Protection

The protection of consumers is governed by the Law on the Protection of Consumer Rights, initially adopted in 1991 and amended in 2003. This Law regulates the relationship between consumers and vendors or providers of work and services and establishes rights and obligations. As per the law, consumers have the following primary rights to enjoy the high quality and safety of goods and services, acquire product information, and get compensated for losses and damages due to producer's or vendor's fault.

Cybercrime is not new to Mongolia. In 2017, there were 299 cybercrimes registered. The number has doubled in 2018³⁸. Even though, cybercrime is not new, there is a lack of regulation in this field as there is no specific law for cyberbullying or data privacy now. Overall category of the cybercrime is included in the Criminal law and some incidents regarding cyberbullying is regulated by bullying and humiliation articles of the law. The Parliament is going to discuss the law on Cybersecurity in 2019.

Tax law

The Corporate Income Tax (CIT) law of Mongolia governs the taxation of profits of:

- Economic entities formed under the laws of Mongolia;
- Foreign economic entities that have their headquarters in Mongolia, and
- Foreign economic entities that earn income sourced in Mongolia other than via the above.

Mongolia is ranked at 61st in the world in terms of paying tax ranking by the Ease of Doing Business (WB, 2018). Tax incentives or benefits are available to the agriculture and mining industries. Taxable income is defined as aggregate annual income minus allowable deductions. For CIT purposes, the progressive rate scale from 10%-25% is used:

- 10% should apply for the first annual income of MNT 3 billion (approx. USD 2.2 million);
- 25% should apply for any excess of MNT 3 billion.

All the government tax service is digitalized that companies can pay their tax, submit their reports online and other tax related service accessible online.

Regarding the tax in digital technology, there is no tax exemption introduced for digital services yet. However, the Law on Investment provides investors with certain tax incentives such as exemptions from tax, tax credits, possibility to use accelerated depreciation for tax purposes, tax loss carry forward, and deduction of employee training costs from taxable income. Recently, the Government started discussing about tax exemption or reduction for technology and innovation start-up companies.

ICT Regulations

As the sector is relatively new compared to traditional sectors, the regulatory environment seems to be relatively liberalised and not heavily regulated. "Out of all three Regulatory Commission in Mongolia, Communication Regulatory Commission is the most market-oriented and supportive to market competition" stated by Bilegdemberel Badamdorj, Director of IT Policy Planning Department.

The main legislation for the ICT sector includes Technology Law (1998), Science and Technology Master Plan 2007-2020, The Law on Science and Technology (2006), Telecommunications Law (2001), Law on Radio Frequency, Law on Postal Services, the Law on Digital Signature, and the Law on Violations. The key strategic document in the ICT sector is the State Policy on the Development of Information and Communications Technology (2017-2025) that was enacted within the framework of the Sustainable Development Goal 2030. The regulatory architecture in ICT sector is to define policy directions and regulatory principles to be pursued in supporting interconnectivity and service competition and distributing limited reserves of telecommunications such as radio frequency and numbering.

While examining relevant policies and regulations in ICT sector, it is revealed that Mongolia has an umbrella of policies to develop favourable legal and regulatory environment to support expansion, use and possession of information, communications, high-speed broadband networks. According to the authorities, ICT regulatory decisions are informed by adequate evidence, researches and there are time-bound targets to improve national broadband plan for reducing cost and increasing penetration³⁹, to make available broadband spectrum for high-speed data service⁴⁰.

However, very few of these policy frameworks are implemented. Although 517 nationwide development projects were initiated for the last 25 years, only 132 of them have been implemented⁴¹ and the rest have been remained on the paper. It reveals that there might an insufficiency existing in the state coordination mechanism.

Furthermore, there is specific guidelines for public infrastructure funding and telecom subsidies and the government aims to subsidize access for underserved and underprivileged populations by the Universal Service Fund. However, if we take a closer look at the projects financed by the USF, most of them are rural infrastructure projects

and there is almost no ongoing project in the Ger districts and other underprivileged communities.

Regular monitoring and evaluation for the implementation of state program is compulsory for all agencies and must be conducted every two years according to the law. But the problem within this mechanism is that M&E process becomes not reflective enough for the goals set in short-term or mid-term ranges. For example; Government Action Plan set in 2016 to 2020 in the field of ICT, have been monitored and evaluated only once until now and the second phase is ongoing. Within this timeframe, over 96 percent of the state action plans set in 2016 has been cleared and the implementation level was low.

Competition enables private investment, incentivizes operators to be more efficient, and, as a result, ensures maximum benefits for end users both in terms of quality and prices. In order to allow market competition, defining the boundaries of strategically important value chains in ICT market is crucial. Up to now, there is no universal understanding about separation of up and downstream markets defined by law. Allowing different level of competition in upstream or downstream markets is important and there are different regulatory frameworks which could be adopted. For example, in the mobile market in Mongolia, the downstream market seems to be open for market competition and necessary infrastructure must be shared by downstream operators without duplicating the existing network infrastructure.

Even though these regulations serve as the main regulatory arrangement in the sector, there are many regulatory aspects that are not included but need to be addressed. For example, E-signature issue has been a challenge for fin-tech companies. The legal base of using electronic and digital signature was set as the Parliament of Mongolia adopted the Law on Digital Signature in 2011, followed by a series of amendments to the Law on Civil Registration, the Law on Access to Information and Freedom of Information, the Law on Patent, and other relevant laws. However, the Bank of Mongolia and Financial Regulatory Commission do not accept e-signature for banking services specifically for contract signing and transactions.

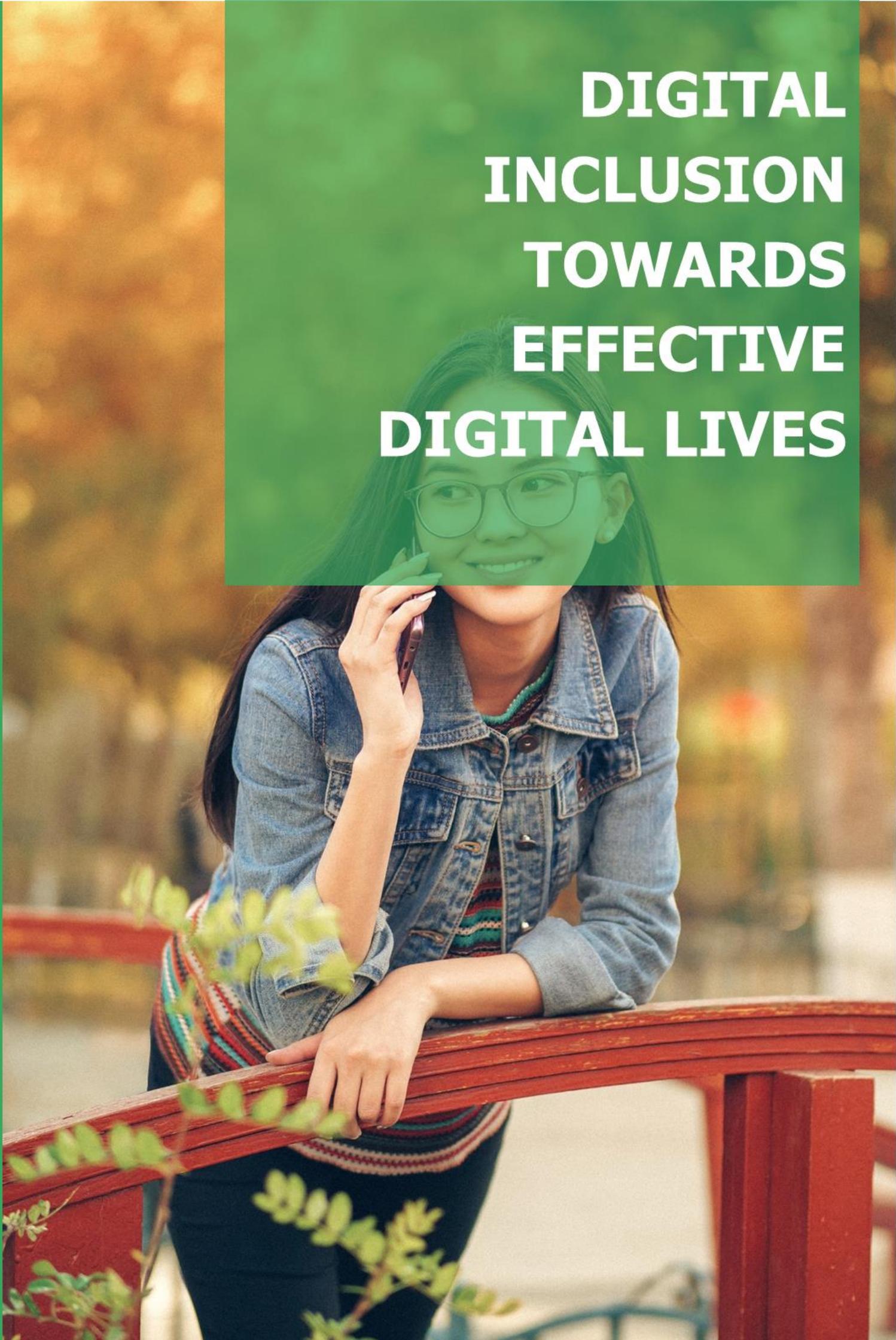
The most successful activities out of all activities being implemented under this document is "Khur and Dan" systems developed by the National Data Centre. With the introduction of these new systems, the citizens now have wide possibilities to be served faster and the services provided by the state to be enriched with innovations.

Mongolia also experience a challenge on e-commerce due to the lack of regulation. The main challenge for development of e-commerce in Mongolia is poor logistic system, low standardized addressing and insufficiently integrated payment system⁴². Two million Mongolians regularly shop online⁴³, accessing both domestic shopping platforms and foreign e-commerce outlets such as Amazon or Alibaba. Facebook has become one of the most popular local platforms for e-commerce, with over 50,000 sales taking place

daily between individual users trading with each other on Facebook marketplace. Furthermore, 64 percent of the millennials use Facebook as an information source for possible online shopping⁴⁴.

Moreover, domestic online shops are not able to support international payment alternatives such as PayPal. Thus, it limits expansion opportunities to foreign markets. Domestic payment systems are also not friendly to customers that it requires to have an internet pin-code, which is a troublesome step for the users. The lack of a strong legal environment for online payment and co-existence of separate payment systems make introducing e-commerce in both domestic and international markets difficult for business entities. Moreover, manufacturers and merchants face various difficulties regarding payment when they go for international e-commerce.

**DIGITAL
INCLUSION
TOWARDS
EFFECTIVE
DIGITAL LIVES**



DIGITAL INCLUSION TOWARDS EFFECTIVE DIGITAL LIVES

Unequal distribution of wealth, entrenched poverty, and marginalization and exclusion of certain groups remain as major challenges in Mongolia. Impacts of economic growth and progress often elude vulnerable groups and poverty levels remain high amongst them.

Poverty and low income may mean that some people lack financial capacity to own a computer or purchase high speed broadband, significantly limiting access to an extensive and expanding range of online resources and assistance now available in Mongolia. Barriers to the labour market, including work-related information availability and limited access to reliable information about education, job opportunities, health, or well-being may result lower level of social inclusion. The poor and unemployed youth and women are the most important groups for inclusiveness.

Table 10. Poverty level in Mongolian regions

	National	Western	Khangai	Central	Eastern	Ulaanbaatar
Poverty headcount ⁱ	29.6	36.0	33.6	26.8	43.9	24.8
Poverty gap ⁱⁱ	7.7	9.7	8.2	7.0	12.5	6.4
Severity ⁱⁱⁱ	2.9	3.7	2.9	2.7	4.8	2.5
Population share (%)	100.0	13.6	18.4	15.5	7.2	45.2
Population ('000)	3063.6	393.6	585.7	492.0	211.4	1380.4
Share in poor (%)	100.0	16.5	20.9	14.1	10.7	37.8
Poor ('000)	7.5	150.1	189.6	127.6	97.1	343.1
Household size	3.5	3.9	3.3	3.1	3.4	3.6
Dependency ratio (%)	41.7	42.8	41.6	41.7	41.3	41.4
Children (% household size)	25.5	27.7	24.1	24.1	25.8	26.0
Age of household head	45.7	46.0	46.1	45.7	45.1	45.5
Male-headed households	75.2	82.2	77.1	74.6	76.3	72.5
Urbanization (%)	67.8	33.4	40.8	48.8	41.6	100.0

Source: NSO, 2018

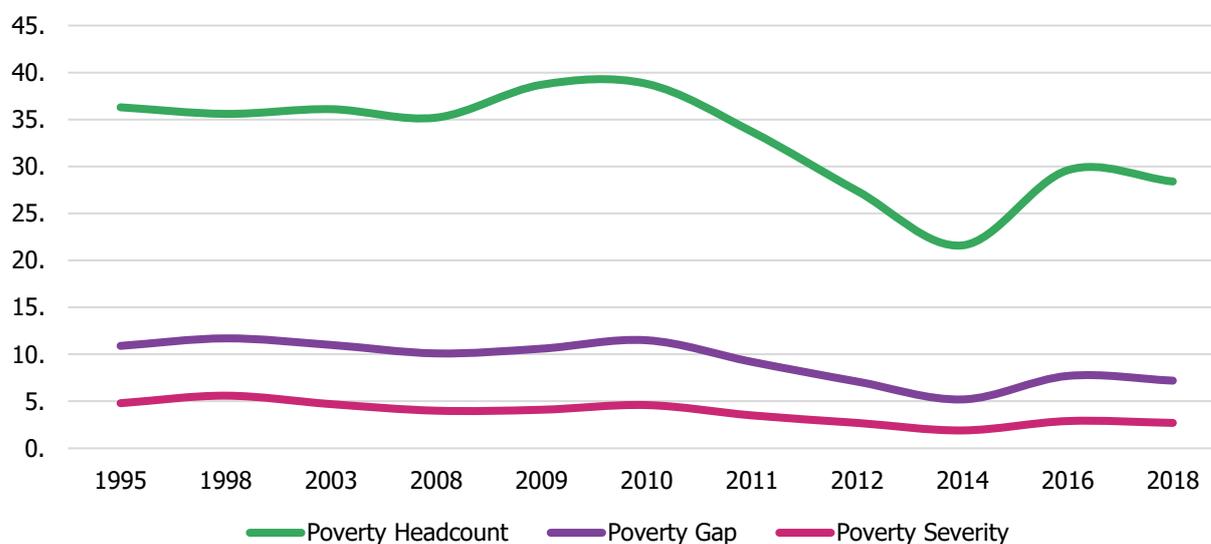
ⁱ Poverty headcount is the share of the population whose consumption is below the poverty line.

ⁱⁱ Poverty gap is the average consumption shortfall of the population relative to the poverty line.

ⁱⁱⁱ Severity is the distribution of the consumption among the poor population.

The general trend of poverty is decreasing in Mongolia for the last three decades⁴⁵.

Figure 7. Poverty level of Mongolia, 1995-2018



Source: NSO, 2019

Up until 2014, Mongolia showed encouraging results in poverty reduction and lifted much of its population above the poverty line. However, the latest indicators show a strong increase in prevalence of poverty since 2014 due to the recent economic downturn, highlighting the fragility of Mongolia's undiversified economy. Many are still vulnerable to falling back into poverty. By 2017, 29.6% of the population live below the national poverty line. The proportion of employed population below USD1.90 purchasing power parity a day is 0.7%⁴⁶.

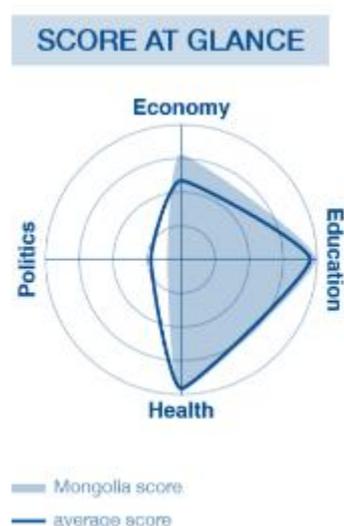
Inequalities in Mongolia haven't skyrocketed over the past three decades. However, Mongolia's overdependence on exports of natural resources makes discrepancies, and economic development is much more rapid in such regions as Orkhon and Umnugobi provinces where the most productive mines are concentrated. Shown in the above table, poverty levels in Ulaanbaatar and the Central region are the lowest, with poverty levels in the Eastern region being the highest.

A shortage of employment opportunities in rural areas, mismatch between education and the labour market demand, gender equality, and cultural norms are identified as considerable causes of poverty. Especially women, female headed households, and youth witness poverty and unemployment greater than the other population segments.

Gender Inequality and Cultural Norms

World Economic Forum's Global Gender Gap Report 2018 ranks Mongolia 58 out of 149 countries. Unfortunately, the following graph and table show the gender gap of Mongolia increased from 2006 which ranked at 42nd to 58th in 2018. The health and survival sub index provide an overview of the differences of men and women's health and it shows that Mongolia has reached parity but does not mean that Mongolia is the number one as many other countries are also ranked at number one.

Table 11. Gender gap score



	Rank (2006)	Score	Rank (2018)	Score
Global Gender Gap score	42	0.682	58	0.714
Economic participation and opportunity	21	0.704	20	0.780
Educational attainment	20	0.999	70	0.993
Health and survival	1	0.980	1	0.980
Political empowerment	101	0.046	109	0.102
rank out of	115		149	

Source: The Global Gender Gap Report 2018, WEF

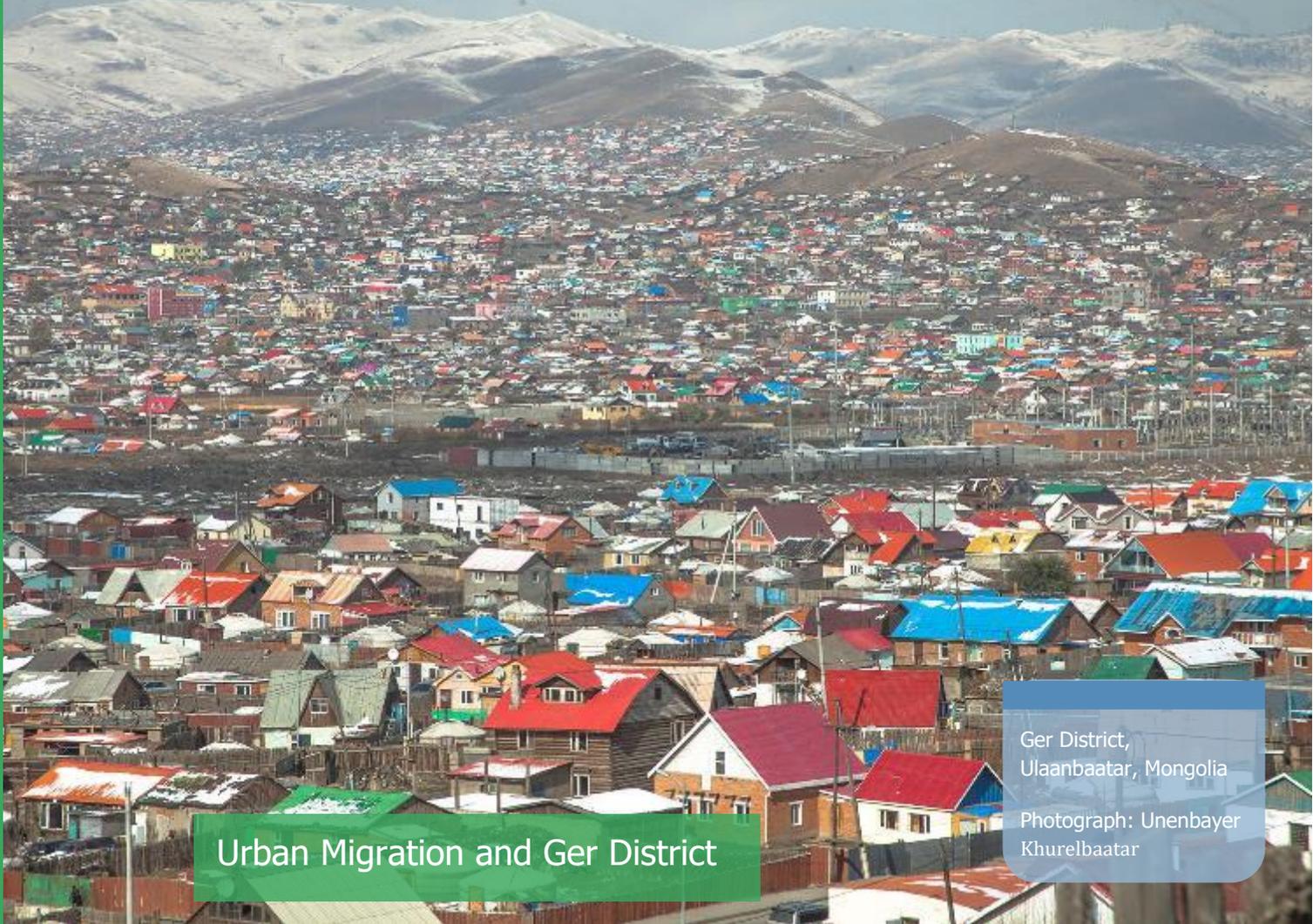
In 2011 Law on Promotion of Gender Equality was approved, and the law ensures gender equality in all spheres and labour and employment relations including education, health, and family relations. Evidence shows that the socio-economic indicators related to gender such as female enrolment rate and women's labour participation have been improved in Mongolia for the last three decades. Though, men and women experience different obstacles due to cultural norms and gendered stereotypes implicated in the division of labour and roles and responsibilities in Mongolia.

While female labour force participation and educational attainment are uniquely high from a global perspective, pronounced gender bias exists in the division of labour between men and women, and the labour market is highly occupationally segmented by gender.

Statistics show that women earn 19.6% less money than men working in same position (NSO, 2018).

However, women are underrepresented in higher leadership positions and high political positions. Women are less represented in decision making in the political and economic spheres due to gendered stereotypes, and cultural norms and behaviour. Women are responsible for domestic and childcare activities, and also dominating the informal economy.

Female unemployment rate is at 6.7%, lower compared to male unemployment rate of 8.2%. Women in the 15-24 age group experience the highest unemployment rate with 18.3%, which is also significantly higher than the national average. Women are less likely to make use of their educational attainment by actively participating in the labour market. Women on average have higher level of education than men in Mongolia, however, labour force participation rate of men is 16.1% higher than women. Improving the flexibility of hiring requirements on women and improving the capability of men are important for reducing this inequality.



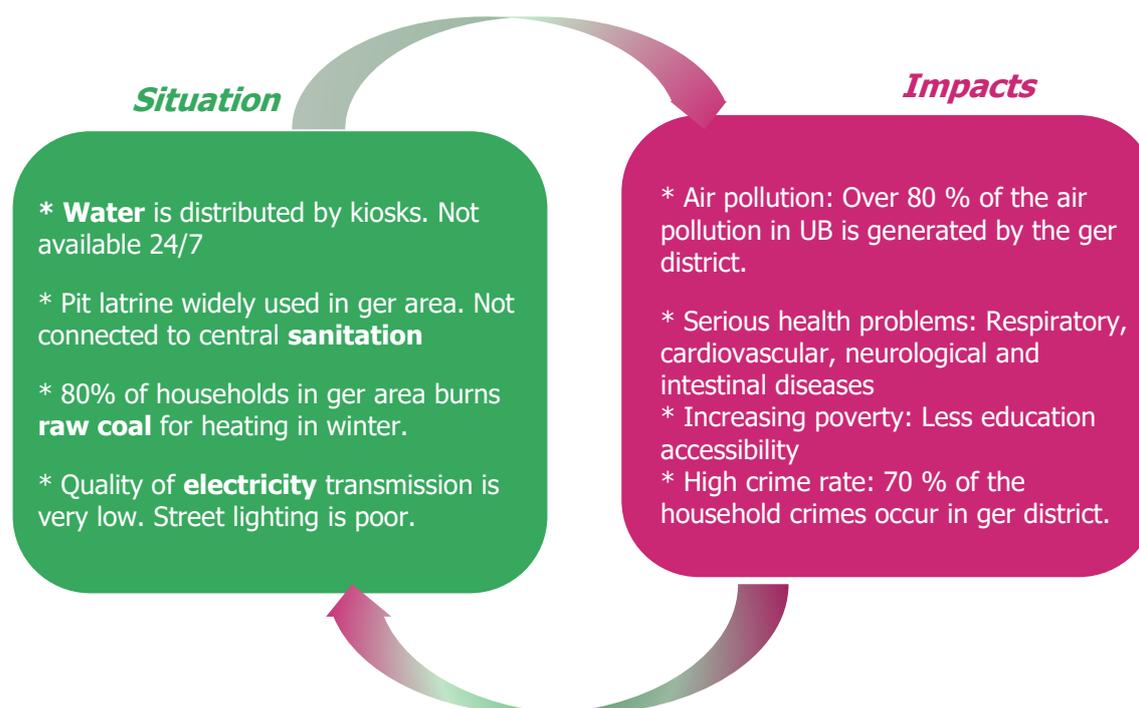
Urban Migration and Ger District

Ger District,
Ulaanbaatar, Mongolia
Photograph: Unenbayer
Khurelbaatar

Mongolia has urbanized rapidly, as people have moved from the countryside to escape deteriorating livelihood opportunities. Urbanization has increased by 0.8% annually on average in the last 28 years, since Mongolia transitioned to democracy from a communism system in 1990. Now, 67.9% of the population lives in the city. Ulaanbaatar has been the main destination of this migration and the population of the city has almost tripled in just two decades⁴⁷. The influx of migrants is overwhelming the available infrastructure and capacity to deliver basic services and threatens to undermine the progress in poverty reduction and human development. The lack of employment opportunities and harsh living conditions in rural areas are the key drivers of increasing trend in urban migration.

The urbanization process itself has the potential to boost economic diversification and job creation by catalysing the development of local economies. Affordable housing, access to reliable electricity and heat supply networks, and a range of other urban facilities and services to improve basic living conditions are the basis.

Picture 3. Common problems in ger districts



Ger⁴⁸ district is a living area under the control of the municipality that is only found in Mongolia. It consists of households living in Ger or traditional houses without any connection to basic infrastructures. About 60% of the urban population lives in Ger districts with limited access to running water and sanitation. Traffic is gridlocked; many schools run three shifts a day, and providing heating and power is increasingly difficult due to a lack of infrastructure in these areas. The Ger district is populated by herders families who lost their livestock due to harsh weather conditions and therefore migrated to urban areas. These families have no other living subsistence, which causes them to fall into poverty and vulnerability. Relatively low cost of living in this district continues to attract many families, especially the groups such as unemployed youth, rural students, and the poor.

On account of poor heating and sanitation infrastructure, and low incomes, residents in the Ger district burn low quality coal, tyres and rubbish in their stoves and boilers to heat in the winter months, resulting in massive air pollution. Additional contributors to the decline in air quality is dust from the desert and unpaved roads, burned coal from power plants, vehicle exhaust. The growing air pollution of Ulaanbaatar has a big impact on the health of the population. The incidence of stunted child development, respiratory and cardiovascular diseases, immune system disorders, and cancerous diseases has risen as pollution levels have gotten more and more out of hand. The PM 2.5 levels in the city are routinely substantially higher than WHO Air Quality Standards with an average level of 75⁴⁹, making air Ulaanbaatar the lowest quality of any city.



Social Welfare

Marginalized group of people

Photograph: Zaluu.com

Mongolia's extensive social protection system has played a prime role in fostering and safeguarding the country's gains in poverty reduction, and the poverty rate would be an estimated 10 percentage points higher in the absence of such programs⁵⁰. Social welfare programs in Mongolia are generally pro-poor, with about 35% of the benefits reaching the poorest 20%⁵¹.

Social welfare system consists of i) pension ii) allowances iii) health insurance iv) occupational injuries and diseases and v) unemployment insurance. According to the Social Welfare Law of Mongolia, both the employer and employee pay the insurances monthly as shown in the following table.

Types of social welfare	Paid by the Employer from the monthly salary (%)	Paid by the Employee from the gross income or monthly salary (%)
Pension fund	9.5	9.5
Allowance fund	1.0	0.8
Health insurance	2.0	2.0
Unemployment insurance	0.2	0.2
Total percentage	12.7	12.5

In 2018 General Office of Labor and Welfare Service reported that pensions and allowances worth of MNT 9.3 billion were granted to 110 500 people from the Social Welfare fund. It shows a decrease of pension receivers by 20.7 thousand or 15.8%, and the number of pensions and allowances by MNT 1.0 billion or 9.9% compared to same period of the previous year. In the same year, 45 700 persons received social welfare pensions and total amount of pensions was increased by MNT 155.9 million or 2.6%, pension receivers were increased by 4.0 thousand or 9.6% compared with the previous year.

In January 2018, 36 400 persons have received social welfare services and mitigations, of which majority or 44.5% goes to social welfare incentives and conditioned cash benefits, 30.8% concession for the elders, 19.8% concessions for disabled people and 4.9% benefits for honored elders. MNT 3.1 billion was disbursed as social services and mitigation, which is an increase of MNT 477.8 million or 17.9% compared with the previous year. Overall social welfare system is partially digitalized as companies can pay social insurances online and also submit their social insurance reports online.

CONCLUSION

Mongolia is being ready for the digital age in terms of hard and soft digital infrastructure. Overall connectedness to internet is higher than the world average and regional average. People living in urban areas enjoy quality and affordable internet access through fixed connections and mobile usage. Discrepancies in digital accessibility are observed among nomadic herders and ger districts due to the lack of basic infrastructure. Providing hard infrastructure to each county or family will direct effective lives for people in the near future, as such the Government should have alternative strategies to increase digital access.

Increasing the usage of mobile phones could be an effective approach for compensating for the lack of rural connectedness. Internet price is affordable for the general public, as household income statistics reveal that Mongolians spend slightly over 2 percent of their monthly income on mobile data. However, for Mongolians on lower income ends, the internet becomes less affordable, decreasing the digital inclusion. These households have less discretionary income to spend. Nomadic herders living in rural areas have a low level of digital inclusion and spend a greater portion of their household income on internet connectivity than the urban population.

In the labour market, there is a huge deficit in skilled labour and a tendency of brain drain for more economic opportunities. Youth unemployment is high compared to unemployment rates in other age groups. A shortage of employment opportunities in rural areas, mismatch between education goals and the labour market demand, and gender inequality can be identified as considerable causes for poverty. Women, especially those who head single parent households, and youth suffer from poverty and unemployment to a greater extent than other segments of the population.

Digital identification has been developing over the last few years. Introduction of electronic ID card and e-Government services are considered as a major achievement of Mongolia in the digital age. Banking, telecommunications, and other private sectors are enabled to use such digital identification, and services have become more accessible and less costly. Over 90 percent of adults hold bank accounts, and 20 percent of them are using mobile transactions actively. However, the absence of a strong legal environment for online payments and integrated gateways are the issues that should be tackled in the near future.

Regulatory environment is likely to support new businesses as there is no identified significant entry or exit barriers for businesses, and the economy is highly open to foreign trade and investment. The tax burden is also among the lowest in the world across the spectrum of taxation. However, financial system, consisting of major banks, are not reflective enough to support start-up businesses. Loan interest rate is comparatively high, and requirements are too tight for new businesses. The current

ecosystem would largely benefit from a network that connects private investors with entrepreneurs as well as programs that provide guidance to entrepreneurs on securing funding.

Considering readiness conditions Mongolia can capture digital opportunities brought by disruptive technologies. Digitalization of economic sectors including mining, agriculture and electric industry is a primary step towards a sustainable future. Resolving inequality and education gap among all social groups in Mongolia is feasible thanks to digital technologies. Outsourcing IT talents, striving for innovation and becoming a hub for digital start-ups in Asia is not a dream anymore.

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- ¹² ITU (2018), Mongolia Profile
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- ¹⁴ Communication and Information Technology Agency Mongolia, available at <http://cita.gov.mn/?p=7321>
- ¹⁵ E-business Development Center, 2017
- ¹⁶ As of 2018, the population of Mongolia is counted 3,238,479 of which 1,591,848 are men and 1,646,631 are women
- ¹⁷ Specifically, 30.94 percent of the total population are children aged 0-14, 62.4 percent are persons aged 15-59 years old, and 6.66 percent are seniors aged 60 and older, according to NSO.
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- ²⁰ The Executive Opinion Survey is a key ingredient of the Global Competitiveness Report series of World Economic Forum and it provides a yearly evaluation of critical aspects of competitiveness for which statistical data is missing because it is either impossible or extremely difficult to measure on a global scale.
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- ²⁸ In 2012, Mongolia improved its credit information system by eliminating the minimum threshold for loans included in the database. In 2013, Mongolia improved access to credit information by adopting a law that provides for licensing of credit reference bureaus and guarantees borrowers' right to inspect their personal data. In 2017, the credit registry began distributing data from a utility company, improving access to credit information. In 2018, Mongolia strengthened access to credit by introducing a new Law on Movable and Intangible Property Pledges and by setting up a new collateral registry. See more at World Bank Group (2019), Doing Business Report Mongolia, page 27-30
- ²⁹ In 2013, Mongolia strengthened investor protections by increasing the disclosure requirements for related-party transactions. In 2015, Mongolia strengthened minority investor protections by introducing a requirement for public joint stock companies to publicly disclose related-party transactions within 2 business days. See more at World Bank Group (2019), Doing Business Report Mongolia, page 31-34
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- ⁴² It is required to contract with at least five different financial institutions or commercial banks and to develop a customized programming code with each institution.
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- ⁴⁴ Survey on National Media Usage, 2019
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