

#### Acknowledgements

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# Acronyms and abbreviations

ADSL	Asymmetrical Digital Subscriber Line
ASEAN	Association of South East Asian Nations
GB	Gigabit
ICT	Information and Communication Technology
ISP	Internet Service Provider
LDC	Least Developed Country
MB	Megabit
MPTC	Ministry of Posts and Telecommunications
MSME	Micro, Small and Medium Enterprise
NIS	

### **Executive Summary**

This report, based on field research (See Organizations Consulted) and primary source material (see References), reviews steps that the Kingdom of Cambodia has taken to leverage broadband Internet for national development. In regard to affordability and use, Cambodia has both the cheapest mobile Internet prices and the third highest mobile data usage in the world. Internet usage in the country is second highest among Least Developed Countries (LDCs). Virtually the entire nation is covered by a mobile signal and almost half the population over the age of 14 had a smartphone in 2016. These are remarkable achievements for an LDC.

The major driver behind these accomplishments is one of the most competitive markets in the world. Up to now, the market has been largely unregulated, attracting significant foreign investment. There are seven mobile and over thirty wired Internet service providers. There is no incumbent operator influencing the market and spectrum has been allocated rather than auctioned, contributing to low prices.

Although broadband connectivity is robust for an LDC, Cambodia has not fully seized the socioeconomic impacts from this. Most usage is for social and entertainment purposes. The top website is the video sharing YouTube portal. Practically, every Cambodian online is a Facebook user and many government agencies and private businesses have a Facebook page making it one of the most popular websites in the country. Although there are anecdotal stories of the beneficial impact of such usage educational videos or e-commerce they are rare and most usage is for entertainment purposes. The usage of web sites by businesses is limited and Cambodia fares poorly in online e-government usage compared to other LDCs.

While there is a direct economic impact from the country's Information and Communication (ICT) sector, it is not particularly high relative to other LDCs. At the same time, the country incurs a significant trade deficit in ICT-related activities. Personal data is sent abroad generating millions of dollars of advertising revenue for overseas ICT companies. Despite a growing ICT workforce and cheap labor costs, Cambodia also imports far more than it exports in computer and information services.

There is a need for a high level, holistic strategy of how to leverage the country's relatively high level of broadband connectivity for greater social and economic impact. This should be accompanied by enactment of key digital economy laws on electronic transactions, data privacy, consumer protection and cyber security to inspire confidence and attract investment in the development of applications and services. Regulatory guidelines are also needed in areas such as new housing zones including spaces for telecommunications equipment and the use of micro sites for mobile antennas. The light touch regulatory approach that has been a hallmark of Cambodia's inexpensive Internet prices should be retained. Consideration might also be given to establishing an inter-ministerial group considering the crosscutting nature of broadband that would include not only the Ministry of Posts and Telecommunications but also the Ministry of Finance and other ministries. Government needs to implement the ICT sector Masterplan that deals with key areas fundamental to the development of the digital economy and which would result in greater impact from broadband connectivity. Public e-services need to be launched that would not only save time

# Cambodia in Context

A country's social, economic, historical and geographic context influences the deployment and use of Information and Communication Technology (ICT) networks and services.<sup>1</sup>

The Kingdom of Cambodia is located in South East Asia. It has land borders with Thailand (to the Northwest), landlocked Lao PDR (to the Northeast) and Vietnam (to the East)

Figure 0.2: Cambodia, GNI per capita (US\$)

Source: World Bank. Exports of

## Policy and Regulatory Environment

### 1.1 National Strategic Development Plan

Cambodia's *National Strategic Development Plan (NSDP)* covers the five-year period from 2014-2018. An overarching goal is Cambodia achieving upper middle-income status by 2030 and developed country status by 2050. The plan is structured around a "Rectangular Strategy" with Information and Communication Technology (ICT) considered a physical infrastructure with targets relating to infrastructure goals. This is different than plans in some countries where ICT is perceived as more of a crosscutting technology. ICT policy priorities in the plan are identified in Box 0-1.

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### Figure 0.1: Four thrusts of the ICT Masterplan 2020

The plan identifies five flagship projects due to their importance and that merit rapid implementation to demonstrate proof of progress.

Project	Budget (US\$m)	Description
e-Government	3.0	Establish set of core code (class, interface) for developing the public
Development		information system, which is the assortment of tools and guides that
Framework		supports development and operations of systems in Cambodia.

### Table 0.2: Hagship projects in the ICT Masterplan

There was no telecommunication law before 2015. The *Law on Telecommunications* adopted in December 2015 formally established the Telecommunication Regulator of Cambodia as an institution separate from the ministry. The law also streamlines the licensing regime by moving from service specific licenses to unified licenses. It introduces two new funds: one for universal service and one for R&D and human capacity training to which operators must contribute two and one per cent of gross annual revenues respectively. The general principles of the law are now being operationalized through specific regulations.

Cambodia lags in respect to other laws and strategies related to ICT.<sup>12</sup> Laws for electronic transactions and consumer protection are being drafted. There is no privacy and data protection legislation. Cybercrime legislation is being drafted but there is no cyber security strategy and Cambodia ranks 91st in the world in the 2017 Global Cyber Security Index.<sup>13</sup>

#### 1.3 Institutions

The Ministry of Post and Telecommunications (MPTC) is responsible for sector strategy and policy. It also hosts the Cambodia Computer Emergency Response Team (CamCERT), responsible for computer security incidents in the country.<sup>14</sup> The National Institute of Posts, Telecommunications and ICT (NIPTICT), founded in 2014, is under the ministry. NIPTICT carries out training and research.<sup>15</sup> MPTC is also responsible for e-government and supervision of government service providers such as Telecom Cambodia and Cambodia Posts.

The Telecommunication Regulator of Cambodia (TRC) is responsible for regulation and licensing of telecommunications networks and services. Regulatory activities were carried out within the MPTC until 2012 when TRC was created as a separate agency. TRCs activities were formalized in 2015 with the enactment of the Telecommunications Law. TRC regulates operators covering a range of licenses (Figure 0.2).

Global Cybersecurity Index



Figure 0.2: Active operators, June 2017

Source: TRC.

Other institutions with a role in the ICT sector include the Ministry of Information, responsible for radio and television broadcasting policy and regulation. The Ministry of Commerce has played a leading role in promoting e-commerce and driving the development of related legislation.

## Infrastructure Development

This chapter first looks at local access-fixed and mobile networks that serve end users. It then reviews the status of upstream national transmission backbones and access to international Internet bandwidth. It also identifies critical supporting infrastructure such as Internet exchanges and resources such as spectrum.

#### 1.4 Local access networks

Cambodia has a history of a highly competitive telecommunications market characterized by ongoing mergers and acquisitions. It also has the distinction of being the first country in the world where mobile subscriptions surpassed fixed telephone lines (in 1993) (Minges et al., 2002). There are presently six active mobile operators, up from three in 2000 but down from a peak of nine in 2012. Given the number of active operators in relation to its population, Cambodia has been cited as the "most saturated market in the world."<sup>16</sup> The largest largest operator (by subscriber share) is Smart, majority-owned by the Malaysian AXIATA group. AXIATA is active in nine other Asian nations. VIETTEL, the Vietnamese mobile group, is the second largest following the purchase of Beeline in 2015 and uses the Metfone brand. Viettel is active in nine other countries including

Operato	r		Main investor (country)	Share- holding	Year of initial investment	Note
South	East	Asia	SEATEL Group			
Telecom	n (SEATEL)	)	(Sngapore)			

with the top ten capturing 98% of the market (Figure 0.1, right).<sup>19</sup> There were 117,049 fixed broadband subscriptions in June 2017, just over 1% of total Internet subscriptions in the country. Nevertheless, Cambodia ranks 12th among LDCs in fixed Internet penetration. Spider web tangles of overhead fixed broadband wires are quite visible in urban areas and the city of Phnom Penh has ordered the wires to be buried underground.<sup>20</sup>



Figure 0.1: Internet market share, June 2017

Source: TRC.

Network quality is high with Cambodia's mobile broadband speeds the fourth fastest in ASEAN (Figure 0.2). Mobile broadband speeds are also higher than fixed broadband.





Source: Adapted from Ookla.

The Cambodia Daily

million.<sup>21</sup> Asia-Africa-Europe-1 (AAE-1) stretching from Hong Kong to France is a consortium cable with Metfone the Cambodian member.<sup>22</sup>

Figure 0.4: Cambodia backbone transmission networks

Source: https://www.telcotech.com.kh/index.php/international-network

1.7 Other supporting infrastructure and resources

1.7.1

## Usage, Skills and Digital Business

This chapter looks at the level of Internet usage in Cambodia. It explores factors influencing Internet use such as affordability and local content. An overview is provided of businesses involved in digital applications and services and the supporting ecosystem.

#### 1.8 Internet usage

By 2016, 37% of the population aged 15 to 65 used the Internet (Phong et al., 2016), second

proposed by the Broadband Commission as an affordability target.<sup>34</sup> In reality, Cambodian mobile Internet users are spending more than US\$ 1 per month and are receiving significantly more data due to price promotions in the highly competitive market. As a result, Cambodian mobile Internet users have by far the highest data usage rates among LDCs and third highest in the world (Figure 0.3).

Figure 0.3

	Average monthly consumption expenditure US\$ (2015)	500 MB monthly mobile Internet (%consumption expenditure)	Smartphone (%annual consumption expenditure)
Middle fifth	\$84	1.2%	3.6%
Fourth fifth	\$108	0.9%	2.8%
Highest fifth	\$200	0.5%	1.5%
Cambodia	\$101	1.0%	3.0%

country (Figure 0.5, right). Those with a university degree or upper secondary education account

Rank	Ste	Comment
7	Freshnewsasia.com	Breaking news. Hosted in Cambodia.
8	Kon-live.com	Khmer Breaking News. Hosted abroad.
9	Pmhotnews.com	Online lifestyle magazine. Hosted abroad.
10	Kohsantepheapdaily.com.kh	Online newspaper. Hosted in Cambodia.

Note

unique visitors and pageviews.

Source: https://www.alexa.com/topsites/countries/KH.

#### 1.10 Digital business

There is a small but active and growing tech startup scene in Cambodia. Ecosystem support facilities are starting to develop such as co-working spaces, incubators/accelerators, events and funding. Several universities offer degrees in ICT-related subjects. There is a steady supply of labor and some 4,000 students a year with ICT skills are estimated to be graduating each year. In 2013, some 27,689 persons reported having studied computer science (NIS, 2013).

Though still nascent, venture capital and other sources of financing for startups are emerging. Khmerload, a news aggregator and one of the most visited web sites in the country, secured funding of US\$200,000 from 500 Startups, a California-based global venture capital seed fund.<sup>42</sup> Golden Gate Ventures, an early-stage venture capital firm that invests in Southeast Asia has expressed interest in the Cambodian market.<sup>43</sup> Local mobile operator Smart launched a US\$ 5 million Digital Innovation Fund to invest in Cambodian startups.<sup>44</sup>

Online advertising is increasing in the country and can be a significant revenue source for digital businesses. A number of Cambodian web sites are earning revenue through online advertisements. Large IT companies such as Facebook and Google are already estimated to be earning significant revenues from ads targeted at Cambodian Internet users. AdAsia, a major digital advertising technology company in the region recently opened an office in Phnom Penh, citing a rise in mobile broadband penetration.<sup>45</sup>

Applications are growing particularly those using smartphones. Several target transportation such as BookMeBus, an app for reserving bus seats, which won a prize at the 2015-16 Cambodian ICT Awards.

There is some information services export activity. For example, the company Pathmazing provides outsourcing services for eBay Motors. Activities include enhancement of motor vehicle digital photographs and "scraping" of automotive sales information from various web sites into a database. The company employs around 80 staff. It recently launched the Tesjor app whereby users can order food and drinks from different places through an integrated end-to-end process

telecommunications and computer software and information services sectors, equivalent to 0.7% of total employment (excluding agriculture and public services).<sup>46</sup> Availability of ICT employment data might be improved through efforts by sector trade associations.

There are no official time series data of overall investment by ICT firms in Cambodia. Most of the enterprises operating in this sector are privately held and do not publish public reports nor do government agencies collect this data on a regular basis. There are a few sources of investment data but they are not comprehensive.

across ministries; developing human resource, administrative and financial management systems as well as a single window system for trade; and establishing a national data center with a government cloud.<sup>50 51</sup> The ICT Masterplan 2020 also has a section devoted to e-government development.

Figure 0.4: UN e-Government Index, Cambodia

*Note*: In the right chart, OS = Online service index; TII = Telecommunication infrastructure index and HO = Human Capacity Index. The figures reflect the contribution of each component to the overall score. *Source* 

• To improve the relevance and effectiveness of basic education by harnessing the potential of ICT as a major tool to enhance the quality of teaching and learning.

• To develop the ICT-based Professional skills needed by graduates for employment in a knowledge-based society and in order to ensure that Cambodia can compete and cooperate in an increasingly interconnected world.

• To increase the effectiveness and efficiency of Ministry and school management. (MoEYS, 2010)

#### A new ICT in education plan is under development.

A 2009 Memorandum of Understanding (MoU) between the Ministry of Education, Youth and Sport (MoEYS) and telecommunications operator Metfone, to provide Internet access in all schools with electricity

Khmer Academy (khmeracademy.org) provides online university and secondary school study materials in Khmer.<sup>59</sup> Launched in 2015 with the support of the Korea Software HRD Center, content includes video tutorials and discussion forums. The portal won the Cambodia ICT Award 2015-2016 in the category of digital content..66 Tm0 g0 0k2sJETQq0.00000912 0 612 792 reW\*n99f4F3 12\*nBT/

# **Conclusions**

With a highly competitive market, Cambodia has achieved a high rate of Internet coverage and access with the cheapest mobile Internet prices in the world. The unregulated market, combined with dollarization of the economy, no foreign ownership restrictions, auction free spectrum and lack of influence of an incumbent operator, has attracted significant investment into the broadband sector. In contrast, markets in many LDCs are highly regulated

of a high-level government champion means that the outlook of broadband as a crosscutting general purpose technology is not wholly embraced. Instead, broadband is perceived as an infrastructure largely pertaining to the ICT sector, reducing its potential for national development.

As the MPTC moves to a more regulated telecommunications sector, it will be interesting to see if the same dynamism that has propelled the market can be sustained, particularly low prices. The new law includes obligations to contribute a proportion of revenues for new universal service and R&D undertakings. Further, spectrum will now be auctioned. These actions will raise costs for operators, which will be passed on to consumers.

Strengths	Weaknesses
Competitive telecom market with low prices High Internet penetration for LDC Strong connectivity for LDC with relatively high level of mobile coverage and robust backbone network Vibrant startup and tech community Homogenous language market	Low level of digital literacy Lack of ICT vision at highest level of government Limited government investment in ICT for public e-services Lack of low frequency spectrum for better wireless broadband coverage in rural areas Limited macroeconomic statistics on the sector
Opportunities	Threats
Business connectivity market E-government / e-services Computer services exports Diversify economy ASEAN market	Growing ICT-related data and services trade deficit Loss of competitiveness

Table 0.1: Cambodia broadband for national development SWOT

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