

# Digital Mapping & Analysis

## BHUTAN

## Table of Contents

<b>Demographic Overview</b>	3
<b>Digital Connectivity</b>	3
<b>Digital Divide</b>	5
<b>Digital Communications</b>	7
<b>Digital Tools</b>	11
<b>Digital Transformation and Infrastructure</b>	13
<b>Challenges, Opportunities and Recommendations</b>	14
Annex 1 – Key Influencer Criteria	18
Annex 2 – Digital Public Goods (DPGs) case studies	19
Annex 3 – UNICEF Digital Platforms	20

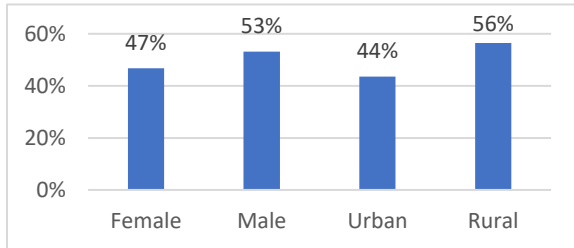
## Purpose of this Document

To support the UNICEF Regional Office for South Asia’s integration of digital tools, technologies, and best practices into Social and Behaviour Change (SBC) programming, this Digital Mapping outlines the existing digital interests, needs and challenges across Bhutan. This document outlines the country’s context, media, digital habits and preferences, emerging trends and recommendations on leveraging the existing opportunities gathered through secondary research.

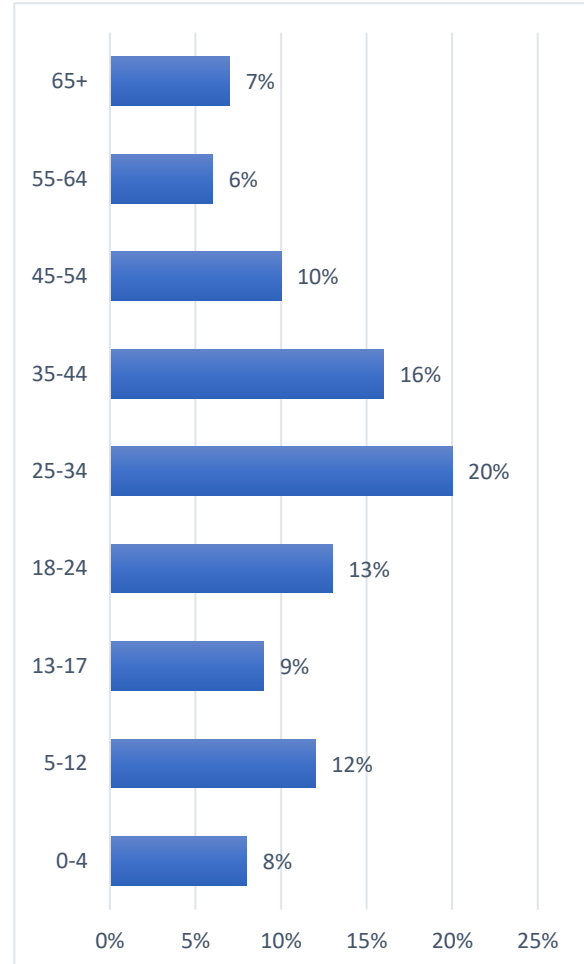
This document can inform digital SBC programme design, development, and implementation at country-level based on the available insights and data from recent years.

## Demographic Overview:

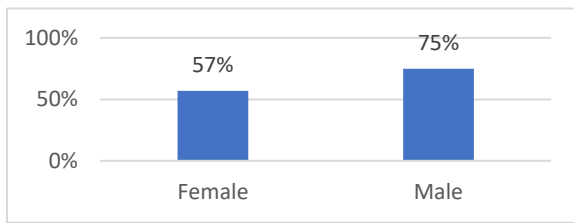
Total Population: 782,455



Age Demographics



Literacy Rate: 66.6% of the population over 15



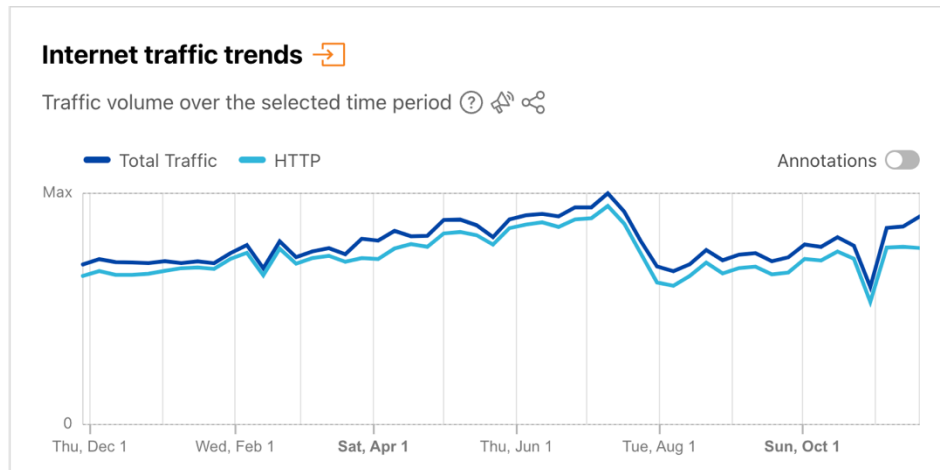
Languages Spoken: Dzongkha (official), Others (Sino-Tibetan languages)<sup>ii</sup>



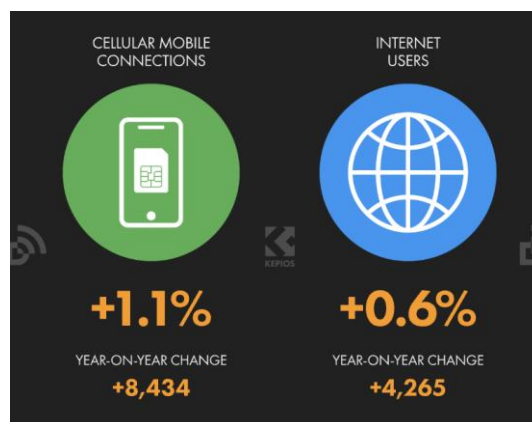
## Digital Connectivity

Digital connectivity in Bhutan has been increasing in recent years. The government has made efforts to expand access to the Internet and improve infrastructure, and as a result, the number of Internet users in Bhutan has been growing. At the start of 2023, there were 672,200 internet users in Bhutan, internet penetration was at 85.6%<sup>iii</sup> and 785,190 mobile subscribers as of Sept 2023 (*number is higher than population as people may own more than one sim*).<sup>iv</sup> However, access to the Internet is still relatively limited in rural areas, and the overall penetration rate is still relatively low compared to other countries. 14.4% of the population remained offline at the start of 2023.<sup>v</sup>

Internet Traffic Trends to Note (Nov 2022 to Nov 2023)<sup>vi</sup>



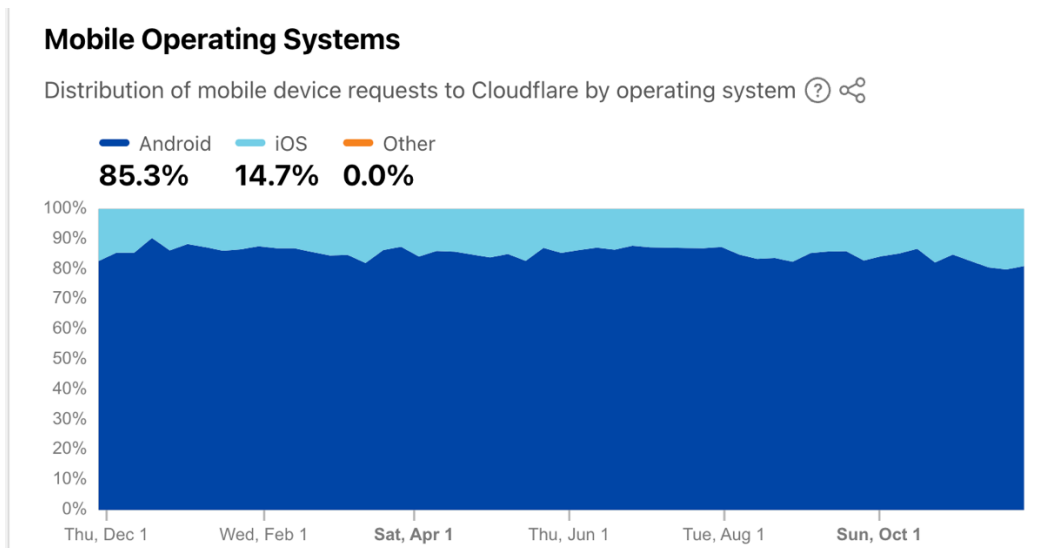
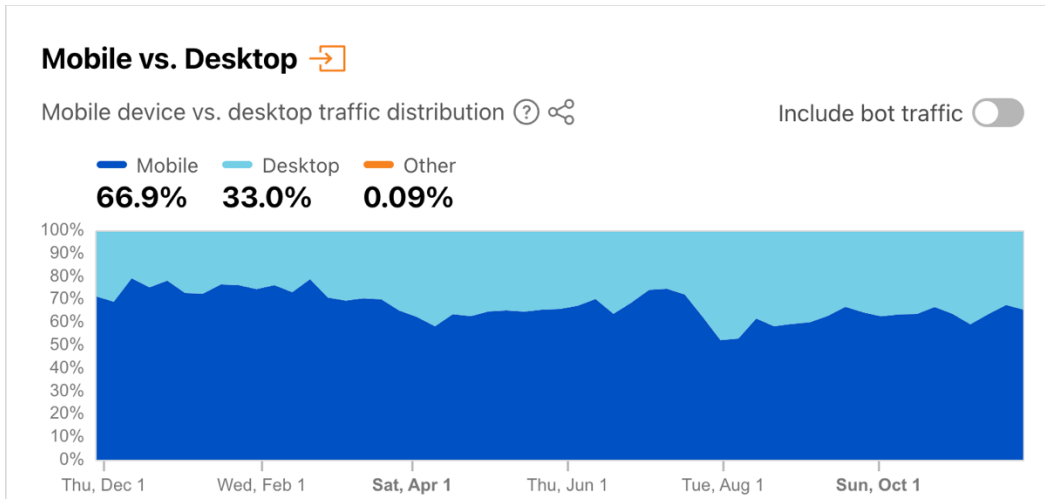
People tend to use mobiles (72.37%), laptop/desktop computers (26.89%), and tablets (0.74%) to access the internet.<sup>vii</sup> 90% of cellular mobiles have either 3G, 4G, or 5G broadband<sup>viii</sup> The average fixed internet speed at the start of 2023 was 17.27 (a large increase from the 2022 figure of 8.12 Mbps<sup>ix</sup>), which is fast enough for video streaming.<sup>x</sup>



Digital Growth<sup>xi</sup> (compared to 2022)

The government has also been promoting the use of digital technology in various sectors, such as education and healthcare, to improve the country's overall development.<sup>xii</sup> However, despite these efforts, there are still some challenges to digital connectivity in Bhutan, such as reliance on Indian telecommunication operators for international connectivity. This creates market constraints for the development of affordable and high-speed internet services, leading to low average speeds (only 4% experience internet speeds above 10 Mbps).<sup>xiii</sup>

Further insights to note (Nov 2022 to Nov 2023)<sup>xiv</sup>



## Digital Divide



### Gender Divide<sup>1</sup>

World Economic Forum’s Global Gender Gap Report 2023 states that Bhutan is one of the countries that has made an improvement of 0.5 percentage points or more and is also one of the countries that has the region’s highest parity score for the Economic Participation and Opportunity subindex. Bhutan is also noted as a country that is ‘either at parity or close to parity in enrolment in secondary education’. Bhutan is 2<sup>nd</sup> in the region on the ‘Global Gender Gap Index ranking by region’, 103<sup>rd</sup> globally (out of 146 countries) and has a score of 0.682 (on a 0-1 scale), a +0.045 change from 2022<sup>xv</sup>.

<sup>1</sup> No recent or relevant data was found about the digital gender divide situation in Bhutan.

For comparison, the Global Gender Gap Index 2022, Bhutan ranked 126 out of 146 globally and 5 out of 8 in the South Asia region<sup>xvi</sup>.

However, women scored lower than men in the education, good governance, community vitality and psychological well-being categories in the Gross National Happiness Index and gender parity at the tertiary education level remains a national concern.<sup>xvii</sup> Women face even more significant barriers in digital entrepreneurship due to lower enrolment levels in STEM education (only 40.7 females enrolled in STEM programmes), as per 2020 data from the Department of Higher Education.<sup>xviii</sup>



### Limited or no access to internet and digital technologies in remote areas

In Bhutan, given the geography and the difficult terrain, communities in remote areas do not have access to reliable connectivity, making it challenging for service providers to offer services cost-efficient and sustainably.<sup>xix</sup> A Senior Information and Communications Technology (ICT) Officer at Bhutan’s Ministry of Information and Communications also stated that because of this, people from remote areas cannot fully participate in the digital economy or take advantage of the benefits of the internet.<sup>xx</sup>



### Lack of Affordability: Cost of Data and Devices

There are high broadband service costs in Bhutan and an entry-level broadband package is about a quarter of per capita income at the international poverty line.<sup>xxi</sup> Though worth noting that the cost of 1GB of mobile broadband data as a % of GNI per capita stands at 1% in Bhutan (*Recommended UN Broadband Commission benchmark is of 2% of GNI per capita*), average price of 1GB data was noted at \$0.71 in 2023<sup>xxii</sup>. Most households have basic mobile and internet coverage and only 2% of the population has fixed broadband connections.<sup>xxiii</sup> The costs of devices in Bhutan stand somewhat in the middle (Maldives with the highest costs, followed by Pakistan and India).



### Low levels of digital literacy

Not a lot of data is available to ascertain the situation. However, according to the World Bank report on South Asia’s Digital Opportunity, only around 1% of employed persons in Bhutan are engaged in the Information and Communication Technology (ICT) sector and ICT contributes only 3.5% to the labor force and 3.7% of Bhutan’s GDP.<sup>xxiv</sup> ICT infrastructure is also not conducive to building the digital skills as noted by the Annual Education Statistics, internet and electricity connectivity in public primary schools is inadequate and basic computer education is limited in Bhutan.<sup>xxv</sup> Worth noting an op-ed in the national newspaper on the state of digital services in Bhutan which quoted a report that revealed that “many citizens, particularly in rural Bhutan, were either unaware of the online services or lacked sufficient digital proficiency to leverage these online services.”<sup>xxvi</sup>



### Public trust with technology

The lack of digital literacy skills and the duopoly over broadband services<sup>xxvii</sup> have contributed to a limited number of Bhutanese adopting technology. Additionally, the country lacks strong personal data protection law as well as cybersecurity laws

(though there is a law upcoming on the protection of personal data).<sup>xxviii</sup> Bhutan Infocomm and Media Authority is the one responsible for the regulation of Information, Communications and Media sector in Bhutan, and thus data protection, but it is noted as only partly an independent body with limited authority.<sup>xxix</sup>



### Slow uptake: Digital public services and platforms and the start-up culture

While Bhutan’s digital economy is less developed than other South Asian countries, the government of Bhutan is attempting to strengthen it. The government has adopted a series of initiatives under Digital Drukyul which aims to incorporate digital content into many sectors from schools to healthcare and hospitals etc.<sup>xxx</sup> And given the geographical constraints, these digital services can be a critical tool to bridge the digital divide.

Good progress has been made with the digital public platforms, with Bhutan jumping from 152nd in 2010 to 103<sup>rd</sup> in 2020 on the UN e-Government Development Survey rankings.<sup>xxxi</sup> A good example would be the Government Data Hub (GDH) which allows for data sharing and it passed the target of number of systems integration and the National Identification System. Though challenges remain as many government services are still not fully digitised, there is low demand from the public (likely due to the low levels of digital literacy), and other issues such as lack of capacity, resources, and technical glitches etc.<sup>xxxii</sup>

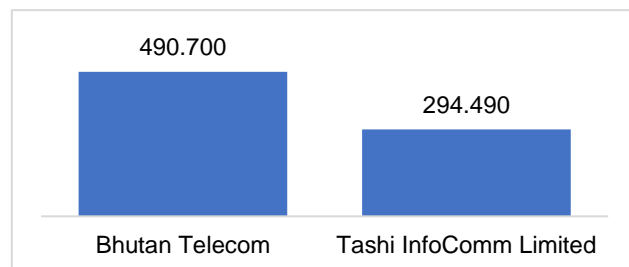
The uncertain legal environment and the cost of starting a business or establishing even a small business has created an uncertain environment for entrepreneurship. It is worth noting that the Thimphu Tech Park is set up and functional to provide skills and knowledge for start-ups, though noted to be not fully meeting the demands.<sup>xxxiii</sup>



## Digital Communications

### Telecommunications

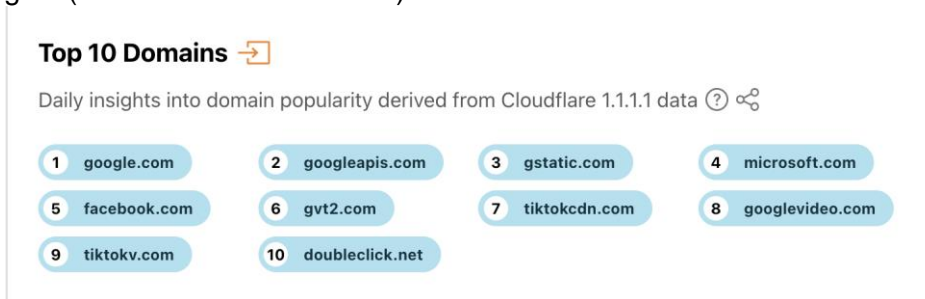
The Bhutan InfoComm and Media Authority (BICMA) is an autonomous government agency established under the Information, Communication and Media Act of Bhutan in 2018. BICMA is the regulatory body responsible for regulating information, communications and media sector in Bhutan.<sup>xxxiv</sup> There are 2 main telecommunication companies: Bhutan Telecom and Tashi InfoComm Limited.<sup>xxxv</sup> As stated above, there were



*Active Mobile Subscribers as of Sept 2023*

785,190 mobile subscribers as of Sept 2023 (number is higher than population as people may own more than one sim).

Domain Insights (Nov 2022 to Nov 2023)<sup>xxxvi</sup>

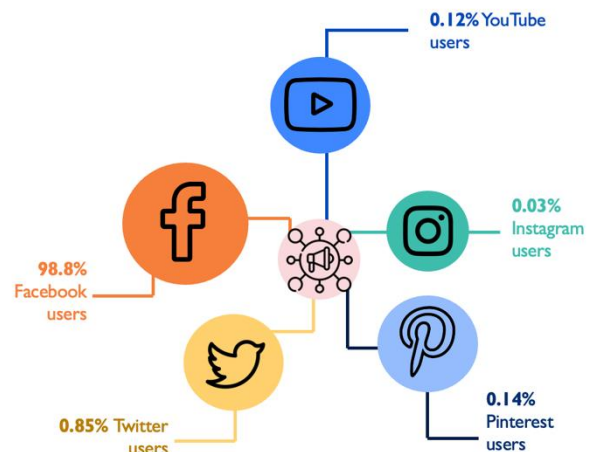


### Social Media

In January 2023 there were 475,300 social media users in Bhutan, 419,200 users were aged 18 and above.<sup>xxxvii</sup> 48.5% of Bhutan’s social media users were female, while 51.5% percent were male.

More than 90% of social media users accessed social media platforms through mobile devices in 2022.<sup>xxxviii</sup> Young, urban, and university educated population uses the social media.<sup>xxxix</sup> The least intensive users are those aged over 60 (49%), agricultural labourers (81%), persons with disabilities, and illiterate persons (68%).<sup>xl</sup> Reasons for using social media are mainly to seek information and for entertainment.<sup>xli</sup>

*\*Reference for the figure<sup>xlii</sup>*



*% of social media users that access third-party websites/information via clicks or taps on links published in social media platform\**

### Social Media Platform Overview<sup>xliii</sup>

Platforms	User Demographics	Usage
<b>Facebook</b>	<ul style="list-style-type: none"> <li>434,500 users<sup>xliv</sup></li> <li>48% Female, 52% Male<sup>xlv</sup></li> <li>Largest user group is 25-34</li> </ul>	One of the most popular social media platforms in Bhutan and is widely used by people of all ages and backgrounds to connect with friends and family, share updates and photos, and stay informed about what's happening in their communities. Additionally, it is a popular platform for businesses/organizations to connect with customers and promote their products & services.
<b>Instagram</b>	<ul style="list-style-type: none"> <li>132,400 users<sup>xlvi</sup></li> <li>54% Female, 46% Male<sup>xlvii</sup></li> <li>Largest user group is 18-24 (38% of users)</li> </ul>	Mainly utilised for tourism promotion in Bhutan, as it is a popular platform for photographers, travel bloggers and influencers to share their experiences and photography.



<b>Linked In</b>	<ul style="list-style-type: none"> <li>97,000 members<sup>xlviii</sup></li> <li>Largest user group is 25-34<sup>xlix</sup></li> </ul>	Less popular compared to other social media platforms and is primarily a professional networking platform. It is most used by people in professional fields such as business, finance, and technology.
<b>YouTube</b>	<i>Number of users and user group data not available</i>	Many businesses and organizations use YouTube to promote their products or services and connect with customers. It is widely used by vloggers, influencers, and content creators to share their talents and creativity with a wider audience and it is also a popular platform for entertainment.
<b>Twitter</b>	<ul style="list-style-type: none"> <li>20,000 users<sup>l</sup></li> <li><i>User group data not available</i></li> </ul>	Used to stay informed about current events, share news and information, express opinions and thoughts on various topics, connect with others who have similar interests and follow the public figures, politicians, and media outlets. Twitter is also widely used by media outlets and journalists to share news and updates.
<b>TikTok</b>	<ul style="list-style-type: none"> <li>No data available</li> </ul>	TikTok is a popular platform amongst the young population and is being utilised by educators and influencers though it remains highly criticized. <sup>li</sup>

### Social Messaging Applications

There are four popular social messaging apps in Bhutan. WhatsApp has 221,000 users.<sup>lii</sup> Facebook Messenger is the most popular, with 377,000 users<sup>liii</sup>. WeChat is the most widely used platform among the other generations.<sup>liv</sup> People over 60 are not strong Facebook users and prefer WeChat. Other popular social messaging apps are Telegram (user data not available) and Snapchat (no data available).<sup>lv</sup>

### Social Media Key Influencers<sup>2</sup>

The top ten key influencers, as identified by the criteria indicated in [Annex 1](#), have been identified below. Local macro influencers, who are celebrities or key opinion leaders will be the priority criteria used for this digital mapping. As they have the most potential for meaningful partnerships with UNICEF, engaging and reaching target communities seems most likely with this cohort. However, key influencers may need to be re-identified depending on the Country Office priorities and the evolving nature of social media influencers.

Influencer	Social Media Platform	Number of Followers	Category	Type of Content
<b>Tshering Tobgay</b>	Twitter Instagram Facebook	Twitter – 94.7K Instagram – 18.6K Facebook – 192K	Political Key Opinion Leader	Social Posts
<b>Kezang Dorji</b>	Instagram Facebook Twitter	Instagram – 39.2K Facebook – 73K Twitter – 491	Entertainment Celebrity	Social Posts Videos

<sup>2</sup> Social influencer statistics may have changed since they were last checked in January 2023.



## Traditional Media Platforms<sup>lvi</sup>

Traditional media, such as television, radio, and newspapers, are still widely used in Bhutan such as to access news, information, and entertainment, provide educational programming etc.<sup>lvii</sup> Traditional media also provides a way for people to connect with their community and learn about local events and are used widely by government agencies to communicate with citizens.

- Bhutan Broadcasting Service (BBS) is Bhutan's only national broadcaster, providing television and radio services in the country. It offers a mix of news, entertainment, and educational programming. Note: Bhutan was the last country to allow in television.<sup>lviii</sup> But cable TV viewers have the option to view Indian and international channels.<sup>lix</sup>
- Kuensel is the oldest and most widely read newspaper in Bhutan. It is published in both English and Dzongkha.<sup>lx</sup>
- Bhutan Times is another popular newspaper in Bhutan, published in English and Dzongkha. It covers national and international news, as well as entertainment and sports.<sup>lxi</sup>
- The Bhutanese Newspaper<sup>lxii</sup>

## Streaming Services/VOD

- [Samuh](#): "first of its kind OTT platform providing video streaming service to Bhutanese in the country and abroad with a wide range of original, licensed and curated Bhutanese content that can be accessed anywhere, anytime and on any device connected to the Internet."
- No data is available on the subscribers for other streaming platforms such as Netflix, Disney+ or Amazon Prime.



## Digital Tools

### Education

The government of Bhutan has embarked on several digital initiatives, known collectively as Digital Drukyl, a 'Whole of Government' (WOG) programme that will leverage ICT to deliver end-to-end online services to the citizens.<sup>lxiii</sup> It includes the creation of 'integrated end-to-end online citizen services, integrated online business licensing schemes and single online customs-trade approvals'.<sup>lxiv</sup>

Part of the program's focus is on Digital Schools, where it aims to develop an Education Information Management system as a single data source for the Education sector<sup>lxv</sup> and also aims to provide connectivity and improve teachers' digital skills so they will use digital content for learning outcomes.<sup>lxvi</sup> An example of this would be the ICT-integrated pilot classroom that has been set up at Dechenchholing Higher Secondary School (HSS) and Loselling Middle Secondary School (MSS) in Thimphu to strengthen students' digital literacy and enhance teacher's digital skills and knowledge.<sup>lxvii</sup>

Other types of digital tools that are being used in Bhutan include:

- Learning Management Systems (LMS) platforms support online and blended learning and for teachers to create lesson plans, assign homework, and grade assignments digitally.<sup>lxviii</sup>

- Scratch coding programmes teach children the foundations of computer science and how to code.<sup>lxxix</sup>
- E-textbooks: can be accessed online and are designed to be interactive and engaging for students.
- Tutoring: private companies can open tutoring centers but teachers are prohibited by law from offering private tutor lessons.<sup>lxxx</sup>
- Digital Libraries are available in many schools, which offer students a wide range of educational resources such as e-books, articles, and videos.<sup>lxxxi</sup>
- Educational Games and Applications<sup>lxxxii</sup>
- Online Assessment Platforms such as Kahoot, Quizlet, and Socrative are also being used to test student knowledge and progress.<sup>lxxxiv</sup>

### Health

Digital health tools that exist in Bhutan include electronic medical records systems, telemedicine platforms, mobile health apps, online appointment and tele-consultation, remote monitoring of vital signs, digital health management systems, and mobile health clinics.<sup>lxxv</sup> Many more are listed in the [National eHealth Strategy and Action Plan](#).

Highlighted:

- Mobile iCTG, launched by the Ministry of Health (MoH) in partnership with UNDP and JICA, is the mobile form of traditional iCGT (cardiotocography devices), which allows the remote monitoring of foetal heart rate and uterine contraction of pregnant women and will help detect high-risk pregnancies for timely referral and care. This was part of the Health Ministry's initiative, "*Reaching every pregnant woman with quality gynaecological and obstetric services*"<sup>lxxvi</sup>
- A good example from 2004: with the use of laptops and multipurpose ECB equipment, two remote hospitals could transmit medical images from remote understaffed centres to a bigger hospital via the internet. This enhanced diagnosis and management and eliminated unnecessary referrals, reducing healthcare costs.<sup>lxxvii</sup>

### Protection

Bhutan has very few protection digital tools that have been developed and are in use. However, during Covid-19, two digital sources were created to make it easier for citizens to submit reports.

- [NCWC app](#) was developed by the National Commission for Women in 2021 with the aim of making it easier and more accessible for women and children to seek protection services. The app allows users to report women and child rights violation cases, access information (e.g. law enforcement agencies), apply for child adoption and alternative care, provides information and access the helpline 1098. However, no data is available on the effectiveness of the application or on active users.
- E-Litigation Platform was developed by the Judiciary of Bhutan with the support of UNDP in 2021. It aims to make reporting easier and more accessible to people by no longer requiring a case to be filed in person at the Court. Instead, people across the country can access the platform either on their phones or at their local community centre by registering and logging into their account. It will allow electronic

registration of cases, electronic filing of documents, electronic payments, and remote hearings.<sup>lxxviii</sup>

- During COVID-19, counselling and case management was provided online through phones and messaging apps.

## Digital Transformation and Infrastructure<sup>3</sup>

Under the flagship programme, Digital Drukya, Bhutan has been developing a range of digital services and applications, including a focus on e-government services, e-commerce platforms, and digital health tools. These services are designed to improve access to information and services for citizens and businesses, and to increase efficiency and transparency in government operations.<sup>lxxix</sup> Bhutan is also one of the countries that had a high ranking in the 2020 UN E-Government Survey<sup>lxxx</sup> and it is the only country that has fully operationalised data sharing across government at the national level.<sup>lxxxi</sup>

The government has been developing policies and regulations that support this growth in the digital ecosystem. It has also been working to establish data centres and cloud computing infrastructure to support the growth of digital services and applications.<sup>lxxxii</sup> They are also aiming to develop digital payment systems to improve access to financial services and to promote the growth of e-commerce.<sup>lxxxiii</sup>

### Regulations

In Bhutan, various laws and regulations have been put in place to govern the use and promotion of digital technology. For example, Bhutan's regulator has laid out a roadmap for 5G technology, with deployments expected to have begun in 2022 (BICMA launched 5G commercially in 2022, but despite such developments, household and business connectivity remains limited.<sup>lxxxiv</sup> <sup>lxxxv</sup>

Some other examples include:

- Information Technology Act of Bhutan 2011 provides the legal framework for the use of digital technology in Bhutan. It covers topics such as data protection, cybercrime, and e-commerce, and is intended to promote the growth of the digital economy while protecting citizens from cyber threats.<sup>lxxxvi</sup>
- Social Media Policy for the Royal Government of Bhutan provides guidelines for the creation and distribution of digital content, to ensure that digital content is appropriate and respectful of Bhutan's cultural and social values.<sup>lxxxvii</sup>

### Artificial Intelligence

- Bhutan ranks 99 (out of 181) on the [2022 Government AI Readiness Index](#) which measures the government (vision, regulations etc), technology (human capital, innovation capacity etc) and data and infrastructure (availability, representativeness) pillars to assess the countries' readiness to leverage and integrate AI in the delivery of public services.
- The Government Technology (GovTech) Agency of Bhutan launched a hybrid program to deliver Machine Learning Operations (MLOps) Program to build the capability and capacity of the local workforce (in partnership with Omdena).<sup>lxxxviii</sup>
- In 2022, The Department of Innovation & Technology ([InnoTech](#)) under Druk Holding & Investments ([DHI](#)), the commercial arm of the Royal Government of Bhutan, partnered

---

<sup>3</sup> Specific data around the percentage of population using online financial services and products could not be found.

with [Omdena](#), a global collaborative platform that makes AI accessible to all. The following activities were listed for this partnership: a global 2-week hackathon wherein InnoTech will identify key themes and issues that can be resolved using innovative AI/ML applications, working with 50+ AI engineers, Omdena School Initiative which will provide Bhutanese learners with access to a few relevant courses to prepare them for the global hackathon and challenge and creating a local Omdena chapter to support continuous learning.<sup>lxxxix</sup>

- First Ever Machine Translator was Built for Bhutan’s Local Language, Dzongkha to English.<sup>xc</sup>



## Challenges, Opportunities and Recommendations

Challenge/ Opportunity	Narrative	Recommendations
<b>Challenges</b>		
<b>Negative perceptions of digital platforms</b>	Usage among children & young adults is a major issue of concern for parents and 66% of parents believe that their children use social media at the expense of other healthy activities. This results in an overall negative perception of digital platforms. <sup>xcii</sup>	<ul style="list-style-type: none"> <li>• Conduct formative research to understand the specific concerns and challenges regarding the adoption and use of digital tech, tools and platforms (especially in regard to gender).</li> <li>• Include 'trust' as an output/outcome and include activities to increase trust around Digital SBC work.</li> <li>• Promote online safety (ensure mental health is a core component of every digital intervention/activity) in all digital interventions and activities: educate communities about the benefits and safe use of digital platforms and technology.</li> <li>• Partner with local communities, influencers and leaders to build trust in relevant digital platforms and technologies.</li> <li>• Establish a social listening mechanism for the 'refine and testing' process for every digital intervention to counter this challenge.</li> </ul>
<b>Gender Digital Divide</b>	No relevant data found.	<ul style="list-style-type: none"> <li>• Gender-disaggregated data and an analysis of the gender digital divide situation in Bhutan are needed to validate assumptions and enable evidence-based decision-making.</li> <li>• Embed the discourse about girls' access to digital into the ongoing SBC/relevant programmes (or as part of any new intervention).</li> <li>• Promote girl's enrolment and participation in STEM programmes: carry out formative research to understand the situation in depth (especially in rural areas), educate the men/fathers/mothers/community leaders/religious leaders/other decision makers on the positive outcomes of ensuring girls/women have access and devices, create STEM programs/tools/platforms for girls, partner with universities for accreditation of courses completed online etc</li> <li>• Develop specific programs, in partnership with the relevant ministries and women/girls, private sector organisations etc, to encourage and promote digital entrepreneurship culture among women.</li> <li>• Partner with women in STEM/FEMTECH to reach and engage with girls/women in urban and rural areas and encourage the use of digital technology as a source of livelihood.</li> <li>• GovTech (DITT), Women in STEM, is an informal volunteer woman from diverse technical backgrounds that have already established a network of girls in colleges to promote digital literacy and skills to young girls in colleges.</li> </ul>



		<ul style="list-style-type: none"> <li>• Establish (in consultation with women/girls) digital centres/hubs/labs/platforms, and partner with local private sector organizations to develop gender-sensitive digital platforms. Give them the ownership of managing these spaces.</li> <li>• Advocate for/create women/girls-only safe online spaces, ensure online safety is a core part of the interventions/discussions.</li> <li>• Mobilise influencers, religious leaders and activists to advocate for online, and device, access for girls/women.</li> <li>• Partner with tech companies to promote their safety measures/safeguarding tools to parents as a stepping stone to bringing girls online and to provide safeguarded devices to girls to ensure ongoing and sustained access.</li> <li>• Partner with telecoms to: provide connectivity to girls/women: such as special data packages etc. Especially for women/girls in rural areas. Expand the reach of <a href="#">existing</a> digital (annex 3) and e-learning platforms (using AI technology and tools), specifically targeting girls/women in rural areas.</li> </ul>
<p><b><i>Underdeveloped or limited digital infrastructure</i></b></p>	<p>Despite recent efforts to improve internet and mobile connectivity, many rural areas of Bhutan still have limited or no access to digital infrastructure, which can make it difficult for citizens in these areas to take advantage of digital services and applications.<sup>xcii</sup></p>	<ul style="list-style-type: none"> <li>• Partner with local organizations/relevant authorities/tech firms to conduct research to identify and address connectivity gaps in remote and rural areas (map the digital footprint).</li> <li>• Partner with the government and private sector (BICMA/MNOs) to improve connectivity and digital infrastructure in remote areas. Or provide data-free access to certain apps/platforms (can be intervention or programme specific).</li> <li>• Partner with relevant authorities to develop alternative solutions such as local access community networks, community-led networks and satellite-based internet solutions.</li> <li>• Implement initiatives that bridge the gap between online and offline communities. Do a service mapping to ensure that SBC digital interventions are linked to relevant support, and this also reduces the online and offline gaps (a community being reached online should be able to get support offline and vice-versa). The loop should be closed.</li> </ul>
<p><b><i>Low digital literacy and skills</i></b></p>	<p>Many citizens in Bhutan, particularly in rural areas, lack the digital literacy and skills needed to effectively use digital technology. This can make it difficult for them to access information and services online, or to participate in the digital economy.<sup>xciii</sup></p>	<ul style="list-style-type: none"> <li>• Support/partner with the Digital Drukyal initiative's Digital Schools component.</li> <li>• Advocate for or provide support to create a balanced curriculum to improve both traditional and digital literacy skills.</li> <li>• Partner with the Ministry of Education (and any other relevant authority) to develop digital literacy programs in schools and communities. Use gamification and interactive learning tools to make digital literacy programs engaging and fun.</li> <li>• Partner with local NGOs to provide digital skills training to marginalized communities (apply design thinking when creating digital tools and platforms to improve literacy skills).</li> <li>• Strengthen the capacity of teachers, educators and parents on digital skills and them to deliver digital literacy programs. The very high use of chat apps for information distribution and consumption (and the use of text formats on these platforms) is an opportunity to reach (and engage) large groups of people quickly and inexpensively in Bhutan for SBC work.</li> <li>• Leverage social media platforms to develop digital literacy skills: promote the use of social media for educational purposes.</li> <li>• Partner with tech companies and organisations, especially women-run and focused, to establish platforms and tools (such as online courses, games, training, hubs, labs, centers</li> </ul>

		<p>etc) that can improve digital literacy, or leverage the <a href="#">existing ones</a> (annex 3) that can be sustained.</p> <ul style="list-style-type: none"> <li>Partner with telcos to provide connectivity and data to ensure that digital tools and platforms are accessible to the community. This will also encourage digital adoption.</li> </ul>
<b>High cybersecurity risks</b>	<p>As in any country, Bhutan faces a variety of cybersecurity risks, including hacking, phishing, and identity theft. These risks can make it difficult for citizens to trust digital services and applications and can discourage businesses from investing in digital technology.<sup>xciiv</sup></p>	<ul style="list-style-type: none"> <li>Partner with local trusted agencies, networks (such as volunteers and young girls circle (youth centre has a network of girls)) and influencers to raise awareness (using existing digital platforms or partner platforms etc).</li> <li>Develop a cybersecurity education programme (included in the digital literacy content as well), advocate for cybersecurity (as part of overall online safety) courses at schools and university level, link up with experts to create the content, and facilitate implementation and accreditation etc</li> <li>Implement personal cybersecurity awareness interventions and programmes for parents/caregivers, children and youth. This could be done by providing training on safe internet practices and partnering with private sector organizations to secure digital platforms.</li> <li>Advocate for policies and regulations that protect users' privacy and data.</li> </ul>
<b>Few Child Protection platforms</b>	<p>There are few child protection digital tools or platforms in Bhutan. While the NCWC is one, there is no data on the effectiveness of the application.</p>	<ul style="list-style-type: none"> <li>Carry out a service mapping exercise on child protection systems already in place (demand, system, referrals, linkages etc).</li> <li>Leverage digital technology to strengthen already established platforms (in partnerships with relevant authorities/stakeholders): <ul style="list-style-type: none"> <li>Raise awareness around the existing hotlines and reporting systems.</li> <li>Increase awareness around the child protection databases (mobile applications/platforms): for use by community members, healthcare providers, and other professionals to report suspected cases of child violence, obtain relevant information etc.</li> <li>Harmonize the child protection case management systems.</li> </ul> </li> </ul>
<b>Opportunities</b>		
<b>Digital Drukyul and the demand for digitally skilled individuals</b>	<p>Both the public and private sectors lack advanced digital skills. In the public sector, there is not enough highly skilled cyber security personnel and in the private sector, there are not enough highly skilled ICT personnel.<sup>xcv</sup></p>	<ul style="list-style-type: none"> <li>Leverage the digital policy and high mobile connectivity to promote digital adoption and literacy. This could include leveraging the existing <a href="#">mobile apps/tools</a> or developing other mobile-friendly digital information platforms.</li> <li>Partner with the Ministry of Education, universities, tech companies and vocational training centres to raise awareness around the need for digitally skilled individuals and promote ongoing initiatives and provide digital skills training.</li> <li>Partner with relevant authorities (such as STEM and Innovation Division under MoESD and BICMA/MNOs) to develop digital literacy programs in schools and communities and partner with CSOs/CBOs (such as Youth centres who can reach out to out-of-school youth and adolescents) for promotion and engagement (can be wholly done through digital means).</li> <li>Partner with universities to provide digital literacy and skills training to empower youth to develop innovative digital solutions to address social challenges.</li> </ul>
<b>Reach of Telecoms/Mobile Network Operators (MNOs)</b>	<p>At the start of 2023, there were 672,200 internet users in Bhutan, internet penetration was at 85.6%<sup>xcvi</sup> and 785,190 mobile subscribers as of Sept 2023.</p>	<ul style="list-style-type: none"> <li>Partner with BICMA and telecoms/mobile network operators to: <ul style="list-style-type: none"> <li>Expand the reach of digital interventions and programmes, particularly in remote and underserved areas.</li> <li>Provide subsidised or zero-rating (no data cost for user) for specific interventions/programmes/activities/community.</li> </ul> </li> </ul>



		<ul style="list-style-type: none"> <li>○ Develop and implement data-driven interventions to bridge the digital divide.</li> <li>○ Use their micro-segmentation on high-engagement channels to target communities and people for specific digital interventions.</li> </ul>
<b>Leverage the LMS/online educational resources</b>	Many schools are located in remote areas. Digital education platforms could help provide students in these areas with access to high-quality educational resources. <sup>xcvii</sup>	<ul style="list-style-type: none"> <li>● Partner with BICMA/MNO operators to expand reach of the LMS/online educational resources to remote areas.</li> <li>● Introduce gamification, and inclusivity elements in the existing online Learning Management Systems for engagement and interest, particularly in remote and underserved areas, to improve access to education.</li> <li>● Develop and implement e-learning programmes/platforms/applications targeting marginalized populations such as women and children. Partner with academia for accreditation of the content/tech.</li> <li>● Promote the use of e-learning platforms to provide education on digital literacy skills and online safety.</li> </ul>
<b>Digital Health: empowering communities</b>	With many remote and rural areas lacking access to healthcare services, telemedicine and other digital health solutions could help increase access. <sup>xcviii</sup>	<ul style="list-style-type: none"> <li>● Partner with healthcare providers and government to promote and deliver digital healthcare services to the last mile (ensure evidence based decisions on all fronts: connectivity, literacy, adoption, accessibility, usability, comfort etc).</li> <li>● Empower the communities to use the digital health platforms/tools: carry out awareness raising sessions, carry out a digital user journey mapping to ensure that the communities find the right information at the right time and are guided to the existing and functional services, ensure design thinking and use relevant data to make evidence-based decisions for the specific community.</li> <li>● Ensure that mental health is a core component of every digital intervention/activity.</li> </ul>
<b>Existing and renewed interest in AI</b>		<ul style="list-style-type: none"> <li>● Leverage this interest by collaborating with the relevant authorities/private sector on using AI for social and behaviour change. Keeping in mind the ethics and risks.</li> <li>● Brainstorm the use of AI in the <a href="#">existing</a> (annex 3) digital tools and technology being utilised in the Bhutan CO for engagement and reach.</li> <li>● Invest in AI capacity building, internal and for target audiences, such as youth (for example as part of social mobilisation) or for girls (as part of the parenting programmes).</li> </ul>

## Annex 1 – Key Influencer Criteria

For the purpose of this document, key influencers have been defined in three ways - by the number of followers, types of content, and level of influence.

Defining influencers by the **number of followers** can be categorised into four types.

- **Mega influencers** are people with a large number of followers, usually over 1M followers on at least one social media platform. Mega influencers tend to be celebrities who have gained their fame offline, however some will have gained their followers online and through social activities.
- **Macro influencers** usually have 40,000 to 1M followers on social media platforms. This group tends to have high profiles and can be great for raising awareness on issues. It may be easier to connect with macro influencers, as there tends to be more of them than mega-influencers.
- **Micro influencers** have between 1,000 to 4,000 followers and tend to be ordinary everyday people who have become well-known and popular for their knowledge about a specific topic. This means that their followers tend to be interested in that specific topic. These influencers tend to have smaller followings but higher engagement and influence with their followers.
- **Nano influencers** have less than 1,000 followers and tend to be experts in a highly specialized or technical field. Similar to the followers of micro influencers, they tend to have smaller followings but higher engagement and influence with their followers. However, they will not have as much influence as micro influencers as they have less followers.

Defining influencers by **types of content** which can be categorised into four types.

- **Bloggers** tend to have the most authentic, active, and engaging relationship with their followers.
- **Video makers** are popular types of content, and most tend to create and share videos on YouTube.
- **Podcasters** are the newest form of content to start generating followers and is growing increasingly popular.
- **Social posting only** is rare and tends to happen in parallel with other types of content creation.

Defining influencers by **level of influencer** which can be categorised into two types.

- **Celebrities** can sometimes lack credibility with specific target audiences, or around certain types of topics.
- **Key opinion leaders** are industry experts that can also be considered influencers who gain credibility among followers and people in general due to their technical expertise, qualifications, position, and experience. Key opinion leaders can include journalists, academics, industry experts, and/or professional advisors.

Macro and micro influencers, who are celebrities or key opinion leaders will be the priority criteria used for this digital mapping. As the potential for meaningful partnerships with UNICEF, to reach their target communities seems most likely with this cohort.

## Annex 2 – Digital Public Goods (DPGs) case studies

### *UNICEF Ghana*

UNICEF's Ghana office is a Pathfinder and runs the StartUp Lab, which assists sustainable entrepreneurs to develop their products and business models. The lab also serves as an incubator for open source startups and educates those considering it. The objective is to prepare DPGs from the StartUp Lab to apply for UNICEF's Venture Fund investment. The Country Office evaluates the StartUp Lab's solutions through its programmatic sections and collaborates with national institutional partners to incorporate open-source work into broader policy solutions.

UNICEF employs various tools, including the StartUp Lab, Venture Fund, and Innovation Hubs, to support innovation at different stages. In Ghana, the UNICEF Country Office used this system to uncover and advance two DPGs: [Bisa App](#) and [EduNOSS](#), as well as DPG nominee [Project Konko](#). For more information visit this [site](#).

### *UNICEF Philippines*

UNICEF Philippines started their DPGs Pathfinding Pilot in early 2021 with two objectives. Firstly, to discover how existing technical country capacity can be advantageous to DPGs and improving Technology for Development (T4D) that are relevant to UNICEF and the government's programmes. And secondly, developing a tool that would allow the sharing of knowledge and capacity among sectors. For more information visit this [site](#).

### *UNICEF Innovation Funds*

UNICEF Innovation funds exclusively invest in open-source technology solutions from new and emerging companies. Through its investments, UNICEF is strengthening communities, increasing the number of DPGs, and having an impact on children. For more information visit this [site](#).

### *Safe YOU: Virtual Safe Space for Women*

Safe YOU was launched in Northern Iraq (Kurdistan) in partnership with UNFPA Iraq and UNFPA Armenia in 2021. With the help of UNICEF Innovation, Safe YOU was recognised as a Digital Public Good (DPG), a digital tool aimed at achieving sustainable development goal number 5 (Gender Equality) as set by the United Nations Secretary General's 2020 Roadmap for Digital Cooperation. Safe YOU aims to be a key resource for evidence-based policy-making through our sophisticated AI data analysis system. This will lead to the prediction & prevention of Violence Against Women & Girls. For more information, visit the site [here](#).

## Annex 3 – UNICEF Digital Platforms

**U-Report** is a messaging tool that enables young people to interact with and raise their voices on issues that are important to them. It is operated by local government, organizations, and young people who record gather information, tips, and opinions from mobile device users on a range of issues. Based on the data and insights gathered by U-reporters, the results are shared with the relevant communities and stakeholders. For more information on U-Report, visit this [site](#). Access UReport South Asia here: <https://southasia.ureport.in/>

**RapidPro** collects data via short message service (SMS) and other communication channels (e.g. voice; social media channels, such as Facebook Messenger, Telegram, WhatsApp) to enable real-time data collection and mass-communication with target end-users, including beneficiaries and frontline workers. The technology allows users to design, pilot, and scale direct mobile outreach services without the help of a software developer in both normal development contexts and humanitarian emergencies. For more information on RapidPro, visit this [site](#).

**Internet of Good Things (IoGT)** aims to build people and communities' knowledge by closing the digital divide. For more information on IoGT, visit this [site](#). Access South Asia IoGT here: <https://sa.goodinternet.org/en/> or the Pakistan site here: <https://nanhayqadam.org/ur/>

**All Children Learning** is a regionally focused platform designed to strengthen assessment capacity and learning. The platform offers four different guidance's (government, emergencies, development, and teaching) to improve the users' assessment capacity and learning. For more information on All Children Learning, visit this [site](#).

**OKY app**: the world's first menstruation education and period tracker app co-created with girls, for girls. Access here: [Okky Nepal](#) and [Okky India](#)

**Bebbo app**, developed by the UNICEF Regional Office for Europe and Central Asia, is an application that supports responsive, positive parenting. It aims to provide comprehensive information about early childhood development and parental care in a parent-friendly format. Bebbo also supports the dissemination of messages and information related to COVID-19 prevention and protection for children. For more information: <https://www.bebbo.app/about-us>

**USupportMe**: part of the Mental Health and Psychosocial Wellbeing Portfolio at UNICEF. It is an app for on-demand psychosocial support services. After successful pilots in East and Central Asia, we're scaling up this innovative solution to meet its full potential.

**UNilearn**: online national learning and knowledge-sharing platform which hosts dynamic education, skills, and other content from different states in India and from other countries.

**AGORA** is a platform that provides learning opportunities to UNICEF's staff, partners, and supporters. The learning opportunities range from specific thematic areas to strategies to languages to career support. For more information on AGORA, visit this [site](#).

**INFORM** provides UNICEF and partners with a turnkey solution for field-based data collection, management and visualization. Inform supports UNICEF's strategic outcomes and strengthens our position as the global leader in data for children. For more information: visit this [site](#).

### UNICEF SOCIAL MEDIA PLATFORMS

## Endnotes

### Definitions to Note:

- **Fixed Broadband Internet:** High-speed connectivity for public use of at least 256 Kbit/s or more in one or both directions (downloading and uploading). It includes cable modem Internet connections, DSL Internet connections of at least 256 Kbit/s or higher, fibre and other fixed broadband technology connections (such as satellite broadband Internet, Ethernet LANs, fixed-wireless access, Wireless Local Area Networks, WiMAX, etc.)<sup>xcix</sup>
- **Mobile Broadband:** Mobile broadband technology allows for a wireless wide area network (WWAN). In simple terms, it provides wireless high-speed Internet access to portable devices by way of radio towers.<sup>c</sup>
- **Data:**
- **Gross Domestic Product (GDP) per Capita:** is the sum of gross value added by all resident producers in the economy plus any product taxes (less subsidies) not included in the valuation of output, divided by mid-year population.<sup>ci</sup>
- **Unbanked:** people with no bank account<sup>cii</sup>
- **Underbanked:** people with insufficient access to banking<sup>ciii</sup>

<sup>i</sup> <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=BT>

<sup>ii</sup> <https://www.britannica.com/summary/Bhutan>

<sup>iii</sup> <https://datareportal.com/reports/digital-2023-bhutan>

<sup>iv</sup> [https://www.bicma.gov.bt/bicmanew/?page\\_id=495](https://www.bicma.gov.bt/bicmanew/?page_id=495)

<sup>v</sup> <https://datareportal.com/reports/digital-2023-bhutan>

<sup>vi</sup> <https://radar.cloudflare.com/bt?dateRange=52w>

<sup>vii</sup> <https://datareportal.com/reports/digital-2023-bhutan>

<sup>viii</sup> [https://www.bicma.gov.bt/bicmanew/?page\\_id=495](https://www.bicma.gov.bt/bicmanew/?page_id=495)

<sup>ix</sup> <https://datareportal.com/reports/digital-2022-bhutan>

<sup>x</sup> <https://datareportal.com/reports/digital-2023-bhutan>

<sup>xi</sup> <https://datareportal.com/reports/digital-2023-bhutan>

<sup>xii</sup> [https://digital-review.org/uploads/files/pdf/2009-2010/chap-16\\_bhutan.pdf](https://digital-review.org/uploads/files/pdf/2009-2010/chap-16_bhutan.pdf)

<sup>xiii</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xiv</sup> <https://radar.cloudflare.com/bt?dateRange=52w>

<sup>xv</sup> [https://www3.weforum.org/docs/WEF\\_GGGR\\_2023.pdf](https://www3.weforum.org/docs/WEF_GGGR_2023.pdf)

<sup>xvi</sup> [https://www3.weforum.org/docs/WEF\\_GGGR\\_2022.pdf](https://www3.weforum.org/docs/WEF_GGGR_2022.pdf)

<sup>xvii</sup> <https://bhutan.unfpa.org/en/topics/gender-equality-15#:~:text=Bhutan's%20Gobal%20Gender%20Gap%20index,the%20gross%20national%20happiness%20index.>

<sup>xviii</sup> <http://www.education.gov.bt/wp-content/uploads/2021/01/State-of-TE-2020-30.12.20.pdf>

<sup>xix</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xx</sup> <https://australiaawardsbhutan.org/stories/sonam-lhamo-narrowing-the-digital-divide-in-bhutan/>

<sup>xxi</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxii</sup> <https://www.cable.co.uk/mobiles/worldwide-data-pricing/>

<sup>xxiii</sup> <https://developingtelecoms.com/telecom-business/telecom-regulation/9287-bhutan-lays-out-5g-roadmap-with-2022-launch-goal.html>

<sup>xxiv</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxv</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxvi</sup> <https://kuenselonline.com/digital-literacy-and-accountability-must-form-the-core-of-digital-society/>

<sup>xxvii</sup> [https://www.bicma.gov.bt/bicmanew/?page\\_id=495](https://www.bicma.gov.bt/bicmanew/?page_id=495)

<sup>xxviii</sup> World Bank Groups, "South Asia's Digital Opportunity Accelerating Growth, Transforming Lives",

<https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxix</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxx</sup> World Bank Groups, "South Asia's Digital Opportunity Accelerating Growth, Transforming Lives",

<https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxxi</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxxii</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxxiii</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xxxiv</sup> [https://www.bicma.gov.bt/bicmanew/?page\\_id=53](https://www.bicma.gov.bt/bicmanew/?page_id=53)

<sup>xxxv</sup> [https://www.bicma.gov.bt/bicmanew/?page\\_id=555](https://www.bicma.gov.bt/bicmanew/?page_id=555)

<sup>xxxvi</sup> <https://radar.cloudflare.com/bt?dateRange=52w>

<sup>xxxvii</sup> <https://datareportal.com/reports/digital-2023-bhutan>

xxxviii <https://datareportal.com/reports/digital-2022-bhutan#:~:text=Social%20media%20statistics%20for%20Bhutan%20in%202022&text=The%20number%20of%20social%20media,on%20data%20to%20learn%20why>.

xxxix <http://www.bmf.bt/wp-content/uploads/2021/05/Social-Media-Landscape-in-Bhutan.pdf>

xl <http://www.bmf.bt/wp-content/uploads/2021/05/Social-Media-Landscape-in-Bhutan.pdf>

xli <http://www.bmf.bt/wp-content/uploads/2021/05/Social-Media-Landscape-in-Bhutan.pdf>

xlii <https://datareportal.com/reports/digital-2022-bhutan>

xliii <https://datareportal.com/reports/digital-2023-bhutan>

xliv <https://datareportal.com/reports/digital-2023-bhutan>

xlv <https://napoleoncat.com/stats/facebook-users-in-bhutan/2023/11/>

xlvi <https://datareportal.com/reports/digital-2023-bhutan>

xlvii <https://napoleoncat.com/stats/instagram-users-in-bhutan/2023/11/>

xlviii <https://datareportal.com/reports/digital-2023-bhutan>

xlix <https://napoleoncat.com/stats/linkedin-users-in-bhutan/2023/11/>

l <https://datareportal.com/reports/digital-2023-bhutan>

li <https://kuenselonline.com/tiktok-new-craze-among-young-bhutanese/>

lii <https://worldpopulationreview.com/country-rankings/whatsapp-users-by-country>

liii <https://datareportal.com/reports/digital-2023-bhutan>

liiv <https://napoleoncat.com/stats/social-media-users-in-bhutan/>

liiv <https://thebhutanese.bt/how-wechat-and-other-social-media-platforms-are-penetrating-rural-bhutan/>

livi <https://www.hilarispublisher.com/open-access/the-role-of-mass-media-in-bhutan-accessibility-influence-and-its-impacts-2165-7912-1000266.pdf>

lvii [https://www.bicma.gov.bt/bicmanew/?page\\_id=539](https://www.bicma.gov.bt/bicmanew/?page_id=539)

lviii <http://www.bbs.bt/news/>

lix <https://www.bbc.com/news/world-south-asia-12484025>

lx <https://kuenselonline.com/>

lxi <https://bhutantimes.bt/>

lxii [https://www.bicma.gov.bt/bicmanew/?page\\_id=539](https://www.bicma.gov.bt/bicmanew/?page_id=539)

lxiii <http://drukjournal.bt/digital-drukyl-an-ict-masterplan-for-bhutan/>

lxiv <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

lxv <http://drukjournal.bt/digital-drukyl-an-ict-masterplan-for-bhutan/>

lxvi <http://www.education.gov.bt/?p=10716>

lxvii <http://www.education.gov.bt/?p=10716>

lxviii <http://mysherig.education.gov.bt/>

lxix <https://kuenselonline.com/rim-begins-basic-coding-training-for-youth/>

lxx

[https://unesdoc.unesco.org/in/documentViewer.xhtml?v=2.1.196&id=p::usmarcdef\\_0000227026&file=/in/rest/annotationSVC/Download/WatermarkedAttachment/attach\\_import\\_9f5fb134-1aa0-4755-be4a-e2ef1527b498%3F\\_%3D227026eng.pdf&locale=en&multi=true&ark=/ark:/48223/pf0000227026/PDF/227026eng.pdf#%5B%7B%22num%22%3A158%2C%22gen%22%3A0%7D%2C%7B%22name%22%3A%22XYZ%22%7D%2C-26%2C835%2C0%5D](https://unesdoc.unesco.org/in/documentViewer.xhtml?v=2.1.196&id=p::usmarcdef_0000227026&file=/in/rest/annotationSVC/Download/WatermarkedAttachment/attach_import_9f5fb134-1aa0-4755-be4a-e2ef1527b498%3F_%3D227026eng.pdf&locale=en&multi=true&ark=/ark:/48223/pf0000227026/PDF/227026eng.pdf#%5B%7B%22num%22%3A158%2C%22gen%22%3A0%7D%2C%7B%22name%22%3A%22XYZ%22%7D%2C-26%2C835%2C0%5D)

lxxi <https://www.sentinelassam.com/topheadlines/india-hands-over-e-library-portal-project-to-bhutan-485281>

lxxii <https://www.bhutanfound.org/snow-leopard-conservation-education-games-developed-for-highland-schools/>

lxxiii <https://play.google.com/store/apps/details?id=bt.gov.dzongkha.dzongkhaenglishphrasebook>

lxxiv <https://blog.gorrectassess.com/best-exam-and-assessment-platforms/>

lxxv [https://www.moh.gov.bt/wp-content/uploads/ict-files/2020/12/National\\_eHealth\\_Strategy.pdf](https://www.moh.gov.bt/wp-content/uploads/ict-files/2020/12/National_eHealth_Strategy.pdf)

lxxvi <https://www.undp.org/bhutan/stories/improving-mother-and-child-health-through-mobile-cardiotocography>

lxxvii [https://www.researchgate.net/publication/4087354\\_Telemedicine\\_in\\_remote\\_areas\\_of\\_Bhutan\\_via\\_PSTN](https://www.researchgate.net/publication/4087354_Telemedicine_in_remote_areas_of_Bhutan_via_PSTN)

lxxviii <https://www.facebook.com/judiciarybhutan/videos/the-judiciarys-e-litigation-platform-supported-by-undp-is-aimed-at-ensuring-unin/470946724148765/>

lxxix <http://drukjournal.bt/digital-transformation-for-a-sustainable-bhutan/>

lxxx <https://openknowledge.worldbank.org/server/api/core/bitstreams/778a3dc7-9da1-5722-a128-50b6b2aa38d7/content>

lxxxi <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

lxxxii <https://www.datacenterdynamics.com/en/news/the-kingdom-of-bhutan-opens-first-government-data-center#:~:text=The%20Kingdom%20of%20Bhutan%20has,Centre%20in%20the%20Thimphu%20TechPark>.

lxxxiii <https://blogs.worldbank.org/endpovertyinsouthasia/bhutan-bets-digital-payments-improve-services>

lxxxiv <https://developingtelecoms.com/telecom-business/telecom-regulation/9287-bhutan-lays-out-5g-roadmap-with-2022-launch-goal.html>

lxxxv <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

lxxxvi <https://kuenselonline.com/digital-privacy-issues-and-challenges-in-bhutan/>

lxxxvii <http://www.bmf.bt/wp-content/uploads/2021/05/Social-Media-Landscape-in-Bhutan.pdf>

lxxxviii <https://omdena.com/blog/govtech-bhutan-partners-omdena-raise-a-new-generation-of-local-ai-leaders/>

lxxxix <https://omdena.com/blog/omdena-partner-royal-government-bhutan/>

xc <https://omdena.com/blog/machine-translator-bhutan-local-language-dzongkha-to-english/>

xci <http://www.bmf.bt/wp-content/uploads/2021/05/Social-Media-Landscape-in-Bhutan.pdf>

xcii

<https://www.unescap.org/sites/default/files/Connectivity%20in%20Bhutan%2C%20Opportunities%20and%20Challenges%2C%20Ministry%20of%20Information%20and%20Communication%2C%20Bhutan.pdf>



<sup>xciii</sup> <https://kuenselonline.com/research-finds-digital-literacy-vital-to-achieve-digital-drukyul-vision/>

<sup>xciv</sup> <https://kuenselonline.com/cybersecurity-week-emphasises-cyber-safety/>

<sup>xcv</sup> <https://openknowledge.worldbank.org/server/api/core/bitstreams/4044c18e-d6ba-50aa-8e3f-efade3ca5ab1/content>

<sup>xcvi</sup> <https://datareportal.com/reports/digital-2023-bhutan>

<sup>xcvii</sup>

[https://www.researchgate.net/publication/233262076\\_Distance\\_Education\\_in\\_Bhutan\\_Improving\\_access\\_and\\_quality\\_through\\_ICT\\_use](https://www.researchgate.net/publication/233262076_Distance_Education_in_Bhutan_Improving_access_and_quality_through_ICT_use)

<sup>xcviii</sup>

[https://www.researchgate.net/publication/335530438\\_Transforming\\_health\\_care\\_through\\_Bhutan's\\_digital\\_health\\_strategy\\_progress\\_to\\_date](https://www.researchgate.net/publication/335530438_Transforming_health_care_through_Bhutan's_digital_health_strategy_progress_to_date)

<sup>xcix</sup> <https://uis.unesco.org/node/3079645>

<sup>c</sup> <https://www.lenovo.com/us/en/faqs/pc-life-faqs/what-is-mobile-broadband/?orgRef=https%253A%252F%252Fwww.google.com%252F>

<sup>ci</sup> <https://databank.worldbank.org/metadataglossary/statistical-capacity-indicators/series/5.51.01.10.gdp#:~:text=GDP%20per%20capita%20is%20the,divided%20by%20mid%20year%20population>.

<sup>cii</sup> <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/technology-media-telecommunications/deloitte-cn-tmt-inclusion-en-200924.pdf>

<sup>ciii</sup> <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/technology-media-telecommunications/deloitte-cn-tmt-inclusion-en-200924.pdf>