

Digital Connectivity And Its Impact On Gross National Happiness In Bhutan During Covid-19

Md Firoj Ali¹, Rafiqur Rahaman^{2*}

¹Department of Computer Science, Ramkrishna Mission Residential College (Autonomous), India

^{2*}Department of Computer Science, Jogesh Chandra Chaudhuri College, India Email: rafiqur.rahaman@gmail.com, Mob: +91 9999903023 ORCID: 0000-0002-2512-7839

Abstract

Bhutan tries to measure progress, not only by the popular ideas of Gross Domestic Product (GDP) but through Gross National Happiness (GNH), where the emphasis is placed on both prosperity and happiness. Happiness multiplies when the people of the country are healthy and stress free. In recent scenario dealing with Covid-19 with impacted population comes out to be a hectic job where spreading awareness throughout the people of the country is very crucial. All the dimensions of GNH moreover depend on Information and Communication Technology (henceforth ICT) development in Bhutan which also plays a vital role in all-round economic growth as well as fighting against pandemic. Here the authors have discussed the best ways to connect other countries of the world through Digital Network Connectivity (henceforth DNC) which is rapidly enhancing the trade, business, skills and innovative ideas to deal with Covid-19. Here ICT acts as a platform to collect updated information about Covid-19 and passes it to the common people of Bhutan to spread the awareness.

Keywords: Digital Network Connectivity (DNC); Gross National Happiness (GNH); Information and Communication Technology (ICT); Subjective wellbeing; Happiness and technology; Sustainable economy

1. Introduction

Due to unique geographical climatic variations and rich biodiversity in Bhutan with deep valleys and mountains, it can be the best place for innovative and quality work culture. The nine dimensions of GNH where all are embattled to wellbeing and a happy lifestyle though the happiness of life comes from several dimensions, but the environment, economy, education, skills and work culture is the main pillar of GNH. The efficiency of work culture mainly depends on two indices viz. 'time use' and 'Psychological wellbeing'. Four parameters of GNH can be categorized as good governance, cultural preservation, sustainable socio-economic development and environmental conservation. We believe that Bhutan has the potential and efficient people who want to open their creative and innovative ideas in IT fields to the other world by developing great ideas of digital marketing. A good many numbers of Asian countries have made commendable achievements in Information and Communication Technology (ICT) and Bhutan has the potential and resources to come to the top of the list in the future. Bhutan ranks first in economic freedom, ease of doing business, peace and excellent working environment amongst South Asian countries. We would like to focus on possible digital network connectivity (DNC) in a more efficient way which enhances the ambience of good work culture, build more startup and scope of employment by connecting with the rest of the world more competently. "Psychological wellbeing" can be fulfilled if and only if bonding of mental and physical health sustains. Fighting against the Covid-19 pandemic requires strong digital network connectivity with ICT awareness. Small Countries economical growth highly depends on Tourism Sector. The Travel and Tourism industry is one of the most dynamic sectors that benefit many other sectors like lodging, catering, transportation, retail, entertainment, etc. The factors impacted tourism industry during Covid-19 are insufficient savings, Traveling Restrictions inbound and outbound (locked down), excessive maintenance cost and lack of information about the services during Covid-19 pandemic. Excessive medical treatment cost of Covid-19 diminished the savings, besides restriction imposed to travelling reduced the trend of tourist arrival. According to "Bhutan's tourism monitor 2020" the arrival of tourist in Bhutan has dipped 90 percent from the previous year resulting plunged into the GDP growth status. Digital connectivity as well as precautionary measures could be used to deal with this epidemic. ICT developments and digital connectivity can play a major role in enhancing the economy and Gross Domestic Product (GDP) in all sectors as well as building mental stability in this pandemic crisis through quality work and great skills. In this paper we see how Bhutan is coping up this pandemic in various aspects such as GDP, factors enhancing the socio-economic development and utilization of ICT facilities to maintain the happiness index ranking amongst the south Asian countries.

2. Literature Review

Bhutan's distinct approach to measure and support the psychological health of its people has made a remarkable impression in the world. Being a small landlocked country, how it maintained its GNH in the pandemic situation also, is the key point of this paper. Here we will discuss some major factors which directly or indirectly impacts any countries growths financially and psychologically such as Economy and GDP Status, The Socio-Economic Development Factors, Feebleness of Bhutan in Enhancing the Socio-Economic Development, ICT in Bhutan, Digital Marketing and Digital Connectivity to combat Covid-19 and maintain GNH Index (Fig.-1).

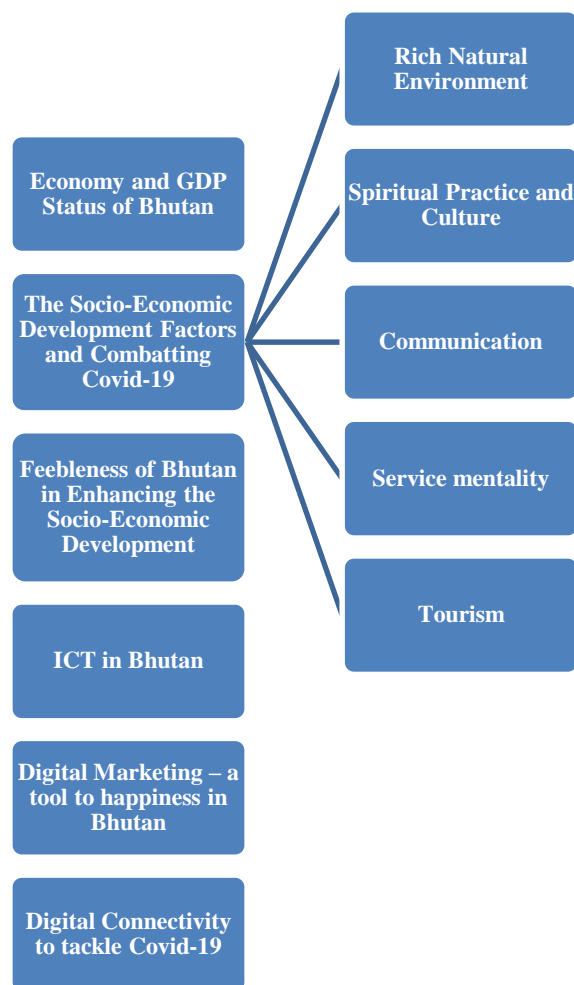


Fig.-1: Factors affecting Bhutan's Growth

2.1 Economy and GDP Status of Bhutan

The Gross Domestic Product (GDP) per capita has decreased in Bhutan by 8.4% in 2020 when adjusted by PPP(purchasing power parity) compared to the previous year due to the outbreak of Covid-19 [Datasheet of World bank report and trading economics website]. Bhutan's GDP per capita (PPP) correspondent to 61 percent of the world's average. It is crystal clear that in last 10 years history of Bhutan's GDP per capita (PPP) has never fallen down compared to its previous year except 2020 (Fig.-2). Over the last 10 year average exhibits more than 7.0 percentages increment to it's GDP [1]. The outbreak of Covid-19 ceased the economical growth of Bhutan hampering rotation or flow of services. Deterioration of service sector, especially tourism industry, due to pandemic shows a sharp deficit in GDP per capita report it is visible that the economic structure of Bhutan has very slow growth in the past several years.

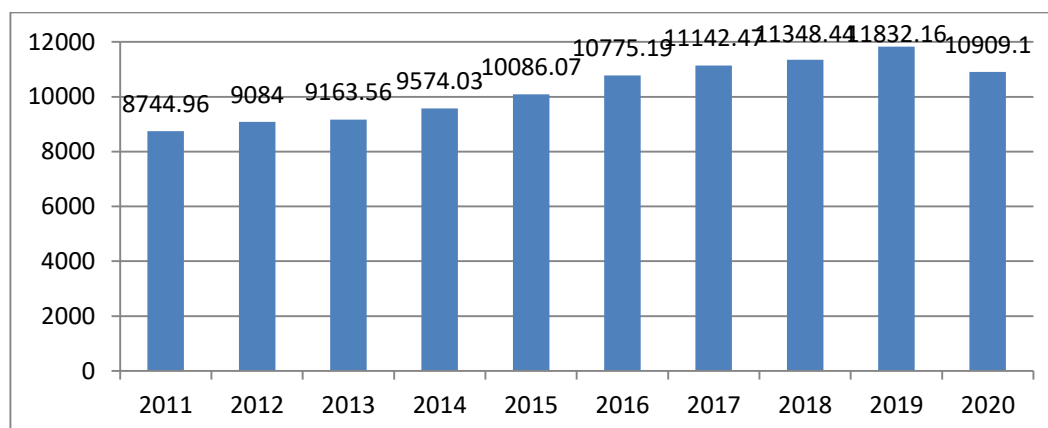


Fig.-2: Bhutan GDP Annual Growth Rate [1]

As an Asian country, Bhutan has tackled Covid-19 in a better way than many of its counterparts. We have collected some of the south Asian countries GDP per capita data of 2020 which exhibits Bhutan holds comparatively better place compared to other countries. Bhutan is just behind Maldives and Srilanka (Fig.-3). The main pillars of service sector are tourism, banking, retail and education. Bhutan has the potential to improve the service sector and enrich their economy to some more extent compared to other developed Asian countries by providing more space to the IT industry, incorporating of industry based training program to multiply the skilled labors to connect with the international market. Already Bhutan adheres new tourism policy to deal with post covid circumstance.

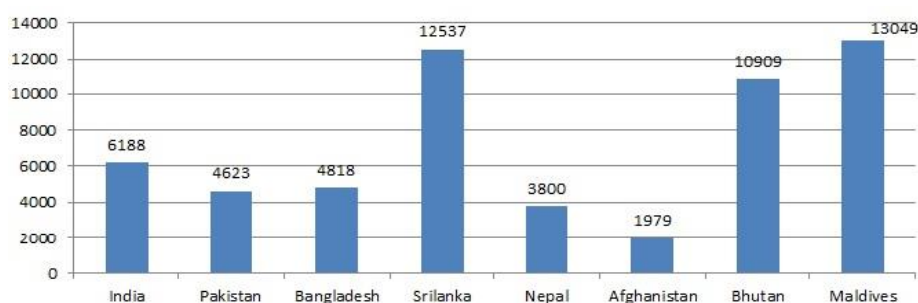


Fig.-3: Annual GDP Growth Rate of Asian Countries [2]

Minimal impact has been observed in Bhutan's GDP growth during this pandemic situation compared to other Asian countries as maximum contribution to GDP holds for agriculture, industries and services sector. Even the growth of main sectors where Bhutan's economy is depended, it is almost flat, even at time decreasing [3] (Fig.-4).

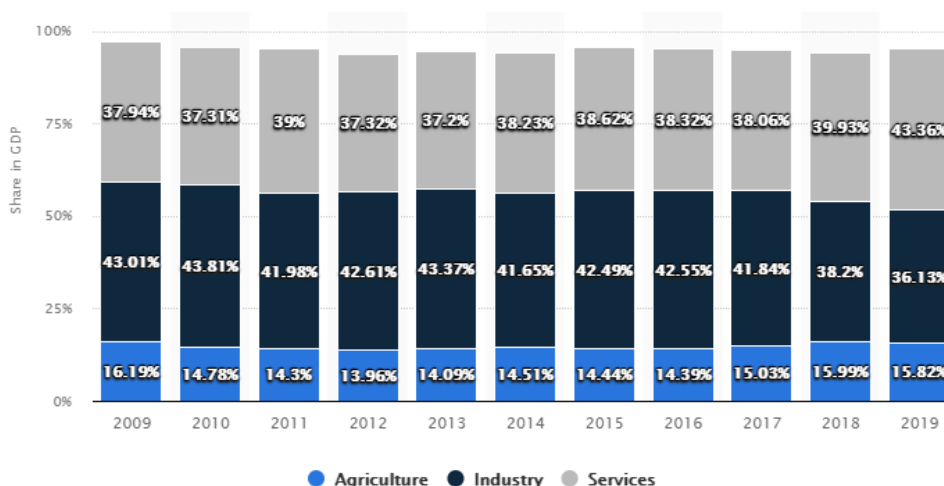


Fig.-4 Share of economic sectors in the GDP of Bhutan

ICT can be a key player to expedite the growth in agriculture. Farmers can utilize DSS (Decision Support System), an aspects of ICT, to increase the quality and production of crops as well as get notified to updated weather forecast.

As per GNH, the main aim is to make a balance between spiritual and material development. Here we are concentrating over the fact how we can create a balance between spiritual and material development because economic growth is a very important part of this balancing factor. The main sectors of Bhutan are hydroelectricity, agriculture and some small industries like tourism, cement, wood products, alcoholic beverages, processed fruits.

2.2 The Socio-Economic Development Factors and Combating Covid-19

2.2.1 Rich Natural Environment: Bio-diversity hot-spot of Bhutan ranks among the best of the world's top ten [4]. The environment plays a critical role in the development and great productivity and it also helps in adding up to happiness at work. The rich environment always makes an affluent and innovative work culture. Vast open space along with pure natural resources (like greenery and pure air) curbed Covid-19 infected graph as well as it helped to recover fast. According to Bhutan's constitution 60 percent of its land should be under forest cover.

2.2.2 Spiritual Practice and Culture: There is a lot of papers about spirituality at work or benefit of spirituality on work performance [5]. Spiritual practice effects on dedication, focus and faith in work which affects employees' peaceful inner life.

2.2.3 Communication : As because English is being taught as an elementary subject from the very basic level for that reason Bhutani people are very much fluent in English using it as a means of communication. Considering this pandemic The Royal Government of Bhutan took initiatives – “Our Gyenkhue” to spread social awareness among citizens. Frequent updates and awareness of SMS (Social distancing, using Mask and Sanitization) are passed to the people using social media, television, radio and newspapers etc. Information provided in multiple languages helped to reach extreme corner of the country.

2.2.4 Service mentality: Although stereotypes of Buddhism do exist among the Bhutani people, they are well dedicated towards a strong service culture and helping nature proves “Volunteerism in Bhutan is placed on the principles of national self-reliance, community participation and social cohesion” [6].

2.2.5 Tourism: Rich tiny country with beautiful forests and mountains along with primaevial Buddhist spiritual environment makes Bhutan one of the best tourist spots in the world. The tourism industry is one of the key driving agents of global socio-economic development. Tourism enhances economic development directly and indirectly. Bhutan government is taking major steps towards improving the tourism industry day by day. From the tourism council of Bhutan, we can see total visitors in 2019 have increased to 315,599 i.e. 7.61% growth over 2018 [7]. The highest number of tourists has been recorded in 2019 [7]. The downfall in tourist arrival data has been drop down about 90.5 percentage due Covid – 19 (Fig.-5).

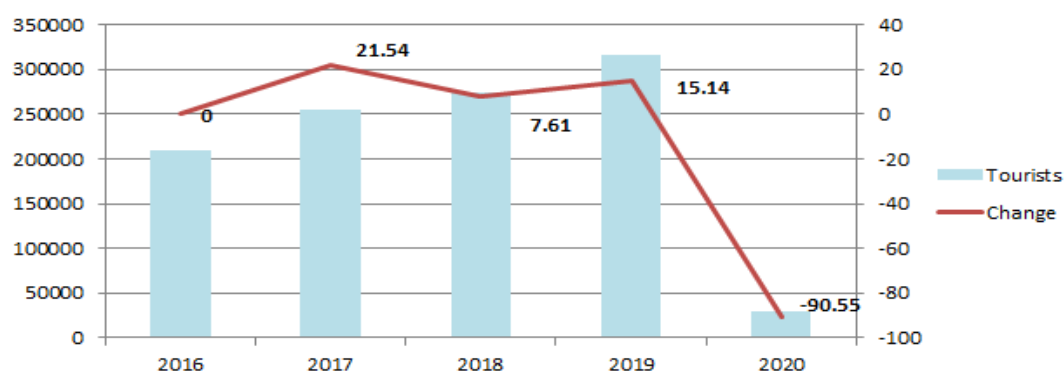


Fig.-5: Tourists arrival trends comparison for 5 years (Source: Tourism Council of Bhutan)

"Our challenge is to increase the number of tourist arrivals, but to spread them throughout the year and throughout the country. So that we don't have tourists bumping into each other," - says the Prime Minister.

But there should be some mechanisms to increase the number of visitors consistently and frequently from all over the world, and the best way is to promote to get high response is massive online digital marketing by different sources like Google ads, social media ads, other internet ads, directory listing, travelling portal listing, Email marketing, Online Bookings to Maximize Revenue. Apart from this more efficient way Bhutan can use Customer Relational Management (CRM) to which they can help to acquire more about customer's needs. Bhutan is such a country that deserves more tourists consistently over the years and it is really possible by consistent online digital marketing throughout the years. Right now Bhutan tourism is not flourishing as up to the mark. One simple example is the official page of Facebook about Bhutan tourism is Bhutan Tourism Council – Facebook likes is 53258 and twitter followers 14.1K which is unexpected, whereas Switzerland's tourism Facebook page has 2.7M likes and twitter followers 119.7K. On an obvious measure,

social networking pages should be updated more frequently and other measures should also be taken to increase the popularity of the Bhutan tourism industry which in turn will attract tourists from all over the world adding up to the economic growth of the country with well international connectivity. In the tourism industry, the world ranking of Bhutan is 87 where Switzerland is 40 though it is geographically more or less similar to Bhutan. So, efficient online digital marketing in a consistent way can enhance the tourism industry rapidly. Here we are focusing on the tourism industry for not only it is increasing economic growth but it also helping to make a good connection with the rest of the world which is very beneficial to increase business and make a chance to work with the world.

To overcome the Covid-19 pandemic situation new tourism policy has been introduced in 2021 which will be guided by high value and low volume to maintain sustainable tourism and branding will be implemented to showcase the hidden beauty of nature [8].

Apart from this Bhutan has some more strength like energy, agriculture, forestry, an excellent vacant business zone, a great subsidy from the government to encourage the entrepreneur for new business and huge opening and chances for innovative and creative work.

2.3 Feebleness of Bhutan in Enhancing the Socio-Economic Development

People of Bhutan are very much efficient and they have the capability for innovative and creative works but they are not well trained compared to other Asian countries. In recent past by using the ICT facilities in various aspects Bhutan has paced it's ranking among the other Asian countries. ICT Development Index (IDI) value of Bhutan peaching at 3.69 which gained the 121 rank out of 175 countries (Fig-6), whereas Bhutan got the rank 119 in 2016 [9]. Here comparison of skills is not only limited to ICT, rather suggesting more training strategies and skill development programs for various industries. Although Bhutan is gradually performing well compared to it's counterpart Asian countries (Fig.6) but following the suggested measures, Bhutan can soon become an upcoming great country for human development and innovative jobs. Bhutan Government and Universities should think about different cutting edge skill development programs and Massive Open Online Courses (MOOC) which is very effective to shine and flourish in the world.

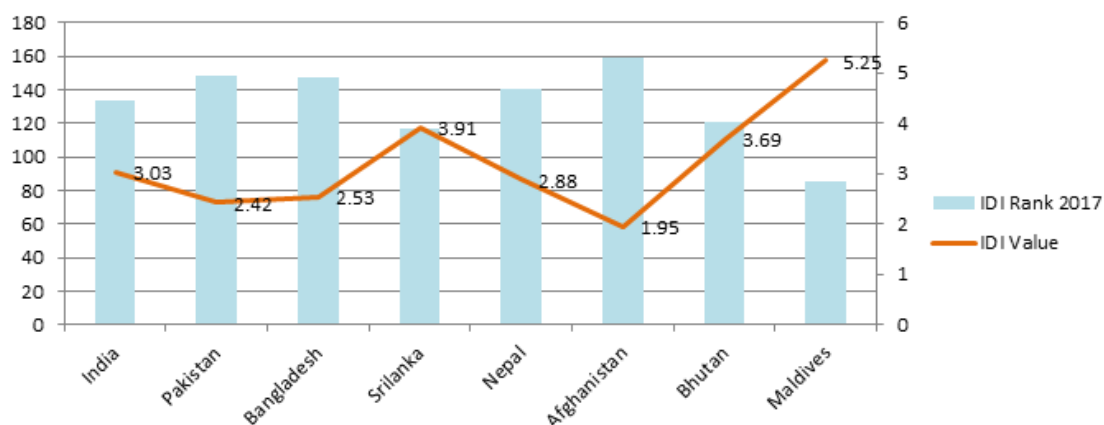


Fig.-6: Rank of Asian countries according to ICT Development Index – 2017 [9]

Initially, they can encourage people engaging with the best different online skills development courses which are free or paid as per requirement like Coursera, MIT open courseware, Stanford on iTunes U, Edx, Udacity, etc. we hope Bhutan also has strategies to do an international collaboration with some foreign universities and companies for different skill development programs that may hands-on or online. Apart from this Bhutan government and universities should encourage people to participate in more international competitions because innovative work can increase the brand value of a country in the world. Companies come to your door when they will get innovations, creativeness and talents. Bhutan Innovation & Technology Centre and Bhutan ICT & Training Association are doing a great job over the last few years for enhancement of Bhutan ICT, innovative work and skills development. Bhutan Government is also planning various strategies to enhance the strong IT industries and happy work culture but it is also required for the country to have more skilled people to enhance the IT industries, business growth, international connectivity and innovative work.

2.4 ICT in Bhutan:

ICT is widely called the "indicator of change". The indications of changes can be brought in several fields; for example changes in the increase of efficiency in marketing and government sectors, improvising the performance of economic growth, increasing the rate of literacy, increasing the industrial opportunities [10]. Bhutan has clutched Covid-19 pandemic exceptionally through imbibing Covid-19 protocols and following some innovative strategies to fight the

pandemic. It is through such changes in the life of the people living in a community we can enable as well as appreciate the role of ICT.

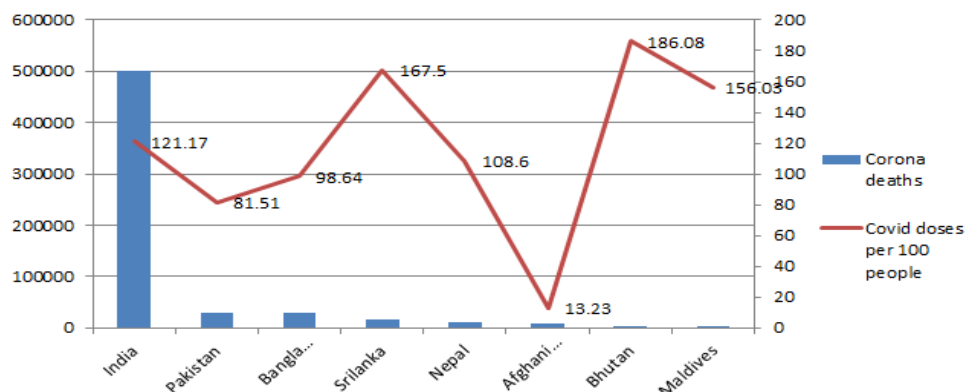


Fig.-7: Comparison of Covid-19 deaths and doses per 100 people of South Asian countries [11]

Death toll in Bhutan till sep'2021 due to Covid-19 is only 4 whereas the vaccination (doses per 100 people which consists of double and single dose) given to the people of Bhutan is the highest 186.08 [Source: Datasheet of WHO coronavirus] This indicates healthy life and mental peace, the hallmark of happiness, can also be achieved in this alarming situation. Proper awareness, timely vaccination, random testing and isolation have helped Bhutan to get rid off mass infection. Here digital network connectivity played the major roll to reach mountainous terrain among the rural areas where the population is in a scattered manner. Last few years, the growth rate of ICT facilities in Bhutan has sustainably increased. For example, mobile and internet uses are rapidly increased from the last few years (Fig.-8) [12].

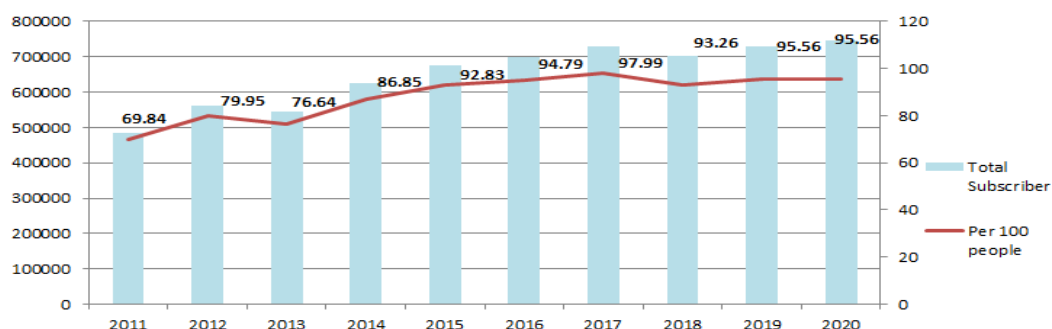


Fig.-8: Yearly Mobile Cellular Subscription trend, 2011 and 2020 (Source: Bhutan Telecom & Tashi Cell)

During the pandemic period the percentage of mobile subscribers in Bhutan remains 95.56 (Fig-8) which implies more rural coverage of internet and expansion of ICT uses.

Other Fast-Growing Facilities of ICT in Bhutan (Table-1).

Table-1: Key ICT indicators- as of December 2020

SI No.	Indicators	Numbers
1	Fixed-line subscribers	22,987
2	Cellular Mobile subscribers	745,137
3	Internet subscribers	734,667
	i. Lease line subscribers	3,751
	ii. Fixed Broadband subscribers	3,189
	iii. GPRS/EDGE subscribers	38,792
	iv. Mobile Broadband subscribers	688,935
	a. 4G subscribers/users	460,324
	b. 3G subscribers/users	228,611
4	No. of Gewogs with access to Mobile services	All 205 Gewogs
5	No. of Dzongkhags head-offices with Fixed and Mobile services	All 20 Dzongkhags

Apart from ICT facilities in Bhutan, a small number of well-educated people have paved their way to join the ICT sectors. The widespread communication skill and the gradually developing network are improvising the infrastructure of ICT in Bhutan. Digital communication acts as one of the best medium to connect with the rest of the world within a very short span of time. The natural resource policy, if the royal government will be intact encasing of the rapid growth of e-business. Bhutan has started shining by the judicious use of ICT which reflects the wellbeing of the Bhutanese. 700 people are currently working at the IT hub of Bhutan, Thimpu Tech Park which consists of seven international as well as some domestic companies[13].

Although Bhutan has been successful in building up an IT hub but still it has not shown required or expected progress in the growing field of Information Technology let alone capitalizing the field or making a profit out of it. It is necessary for Bhutan Government to take serious measures for the promotion of e-governance along with strategies in their country [14]. Bhutan needs a strong IT industry which enhances the brand value of Bhutan in the world and even unlike any other industry, ICT will not be affected by uncertain weather and hostile geographical condition. The most eminent feature is it will not pollute the environment and also balance ecosystems. It has been observed that technological change “plays a pivotal role in long-term economic growth”, which is taking the country to a new level. Bhutan doing a country-driven initiative intended to bridge the connectivity gaps and promote non-discriminatory access to ICT infrastructure for increase coverage, availability, reliability and affordability. ICT can also be more efficiently used in agriculture by creating farmers' networks. Through the tools of sustainable agriculture, the use of pesticides can be kept to an optimal minimum.

2.5 Digital Marketing – a tool to happiness in Bhutan

Online digital marketing is an economic growth engine. It also strikes happiness in terms of sharing information and making a connection with other parts of the world. In section 3.4 we already discussed how Bhutan will grow its strong tourism industry effectively using the digital advertisement. A strong IT industry and rapid online marketing which not only developed the socio-economic rate but also connect a country with the rest of the world to imbibe the hidden business opportunities as well as to nourish the young talent for sharing their innovative ideas.

Digital marketing and social media are one of the most effective ways to build up a connection with the whole world. Bhutan at present now being the global promoter of the concept of happiness is putting on more efforts towards achieving the goal of development being indorsed by Global Happiness. Although this concept of happiness has synchronized quite well in the last few years along with the global trend of growing interest in social media, positive health of mind and psychology and other related concepts.

So it is not possible to fill in the gap in the map and make a relation of digital technologies to happiness. It is obvious that at some point one would have to begin with the concept of happiness which is very complicated to measure. Happiness had no single definition as it keeps on changing from society to society and varies from human to human. The Global Happiness Index (2018) provides us with information that Finland being the happiest country in the world. Whereas the rank of Switzerland is 5th and Bhutan is 97 [15]. So it is clearly visible that happiness has no universally accepted definition as it keeps on changing with every perspective. A lot of writings and journals have been published over the fact that digital connectivity leads to isolation and several other problems in a human's life. So there arises the question in what way happiness and ICT and digital connectivity are related to each other? There are several factors such as jobs, the creation of skills, relationships, social connectivity and ICT in healthcare. The main key to happiness is income and good employment opportunities with a balanced healthy and mentally satisfied life. So a country like Bhutan needs to put on much more effort and seriousness about e-agriculture, proper training for small industries and digital connection at the international level and then farmers and small industrialists. Thus driving up the source of income is correlated with happiness. During pandemic situation massive uses of online shopping has been used to cut down the covid cases in Bhutan.

Zala.bt, druksell.bt, Medhey app, drukbees.com etc. are some popular e-commerce sites which have been used to maintain social distance during Covid-19. Judicious uses of digital marketing curb the spread of novel corona virus renders the people happy.

Sometime people become happy to help needy and poor people by donating money, healthcare services and goods but most of time they are not able to contribute because there is no platform which provides necessary information about needy and type of help required. But with growth in digital connectivity with information and communication technology (ICT) and willingness of people to help the needy proper way[16].

Another major factor of happiness is the relationship with family and others. May you are far away from your family but still you can be digitally connected by social media, Chatting, Video Calls, and other media that can help connect them. Sometimes social media plays an important role to release stress, frustration and make valuable connections throughout the world.[17]

2.6 Digital Connectivity to tackle Covid-19

In the healthcare services ICT helps to find the curative and preventive measures to fight against several diseases. Covid-19 has upended many lives of all the ages but Bhutan Government's policy and pollution free fresh natural resource has created an exception. With the help of digital connectivity through ICT, Bhutan has restricted the infected people count to 5720. The area has been categorized to Mega Zone, Super Zone under Mega Zone and Zones under Super zone according to the severity of infection [18]. Inter Mega Zone travels require special permission through online portal. They reached every corner of the country and tested an active family member of each family to point out infected person hence minimizes the total Covid-19 cases.

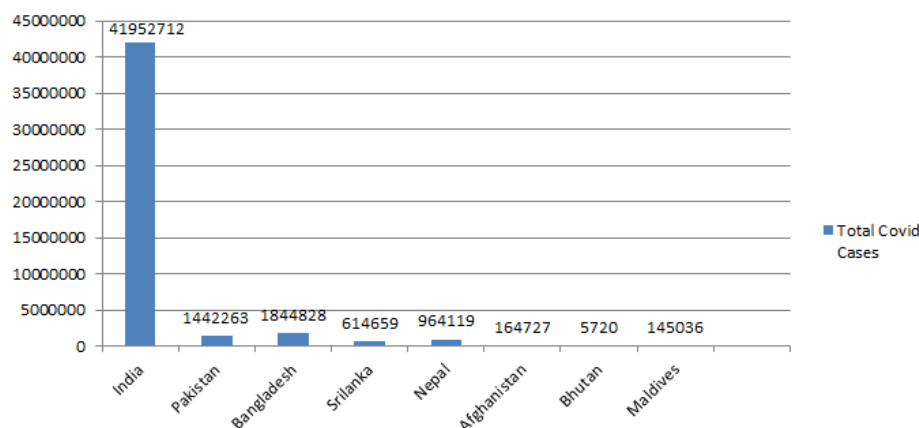


Fig.-9: Total Covid-19 cases of Asian countries Feb'2022 [Source:WHO Coronavirus (COVID-19) Dashboard]

The vivid details eliminate the fear and stress of the pandemic (Fig.-9) from the people across the country. Healthy quality time spent with family members causes a surfeit of happiness. Apart from healthcare services, digital connectivity and social media also play a major role to perform better education by good connectivity, a platform of information sharing, online easy information, online competition, available online courses, etc. Also to remain in the mainstream of the digital world there should be a proper nexus between university and corporates. Improvement of Internet connection and uses of smart mobile is increased rapidly in Bhutan but still, it is not well connected internationally or use of digital connectivity not up to the mark compared to other well-developed countries. Although some south Asian countries have used information and communication technology (ICT) as a key area for its economic development. By employing a good number of well-trained ICT professionals a country can ensure its economy to an excellent point towards achieving the goals of growth and innovations. Bhutan's young generation people have the capacity as well as potentialities to enhance the ICT sector in the world, but for doing what they need more experience on the international job, more digital connectivity and culture to continuously upgrade themselves by the help of social media, tech sites, online open sources, forums blogs. To increase the economic growth of the country, people need to focus on the good quality of jobs, upgraded working patterns, increase in sales and keeping the brand value the same for peoples for years, to build up small companies and industries of its own. And all these factors are possible only by making out a good strategy on how to connect Bhutan with the other countries of the world. Massive digital marketing, professional and correct form of training and timely arranging seminars to plan out about how to make good and profitable as well as strong and suitable business, implementing different skills, providing jobs are the way to happiness by digital and online resources. So the people of Bhutan should try to keep themselves on the same level as the world by collecting all kinds of cutting-edge tools of information and technology and by sharing it with the world as well as within their country.

3. Conclusion

Bhutan, a landlocked country, is among fastest-growing economies in Asia and it has the capability to become a more developed country in the world through a compact digital connectivity in the international market and effective innovative skills.

In this paper the authors have tried to make a bridge between digital connectivity and Bhutan socio-economic enhancement platform along with happiness in the Covid-19 crisis time. Bhutan always focuses on the Gross National Happiness. In spite of pandemic situation, Mental and physical fitness factor favors Bhutan due to Government's endeavour. Government has brought down the covid infected cases causing mortality rate negligible. The government of Bhutan has decided to give priority to the individual's happiness for achieving the progress of development and also focusing on a stable and sustainable economy by implementing policies and taking necessary measures towards the objective.

To tackle the sudden fall of tourism industry Government needs to broadcast the new tourism policy initiative through various social media and official websites. Putting more effort to encourage the technological sector will create wealth in long term thus uplifting the country's GDP will be reflected in GNH.

In retrospect, the paper attempted to make certain pertinent observations. It pointed out the increased relevance and varied utilities of ICT and its related technologies during Covid 19 pandemic in the case of a small conservation nation-state of Bhutan. It argued that the Bhutanese government by leveraging IC technologies was able to handle the pandemic more effectively and efficiently.

Secondly, it argued that adoption of ICT by any nation-states particularly in the South Asian region could very much bolster their efficiency, productivity as seen in the above-mentioned case where the timely digitalization of health-care sector and enabling of ICT services made sure the world's best medical health care practices or other SOP's (Standard Operating Procedures) are shared with the Bhutanese state. The Bhutanese state would do well if it could balance its imperatives of being a digitally empowered country without doing away with its core principle of GNH which stresses on some unique attributes of happiness and spirituality.

References:

1. <https://tradingeconomics.com/bhutan/gdp-per-capita-ppp> (Online accessed 3rd Oct,2021).
2. https://www.theglobaleconomy.com/rankings/GDP_per_capita_PPP/Asia/
3. <https://www.statista.com/statistics/527319/share-of-economic-sectors-in-the-gdp-in-bhutan/>
4. Banerjee, Aparna & Bandopadhyay, Rajib. (2016). Biodiversity Hotspot of Bhutan and its Sustainability. *Current Science*. 110. 521. 10.18520/cs/v110/i4/521-528.
5. Valiūnienė, Vilmantė Kušpikaitė. Spirituality at Work: Comparison Analysis, *Procedia - Social and Behavioral Sciences*, isbn: 18770428, vol. 150, pp. 1205-1212, (2014)
6. T. Choden, "Traditional Forms of Volunteerism in Bhutan," The Centre for Bhutan Studies Post Box No. 1111, Thimphu, Bhutan, 2003
7. <https://www.tourism.gov.bt/resources/annual-reports>
8. [https://www.tourism.gov.bt/uploads/attachment_files/tcb_cW0p_Tourism%20Policy%20eBook%20\(1\).pdf](https://www.tourism.gov.bt/uploads/attachment_files/tcb_cW0p_Tourism%20Policy%20eBook%20(1).pdf)
9. <https://www.itu.int/net4/ITU-D/idi/2017/index.html>
10. Kawai Akinnobu, Wanhdi Tshering. Project Report ICT-enhanced GNH society in Bhutan, *Journal of The Open University of Japan*, No.34 pp.137-151, (2016)
11. <https://covid19.who.int/table>
12. <https://www.moic.gov.bt/wp-content/uploads/2021/02/12th-Annual-Info-Comm-and-Transport-Statistical-Bulletin.pdf>
13. Dorji, T.C., 2020, The Role of Thimphu TechPark in Technological and Socio-economic Advancement, *The Druk Journal*, Spring 2020 issue on Bhutan in the Age of, Vol: 6, No. 1, pp. 28-38.
14. <http://drrgateway.net/information-communications-technology/ict-addressing-unemployment-bhutan> (Online accessed 8th Dec.2021).
15. John F. Helliwell et al., "International Migration and World Happiness," *World Happiness Report 2018*, 2018, 172, https://s3.amazonaws.com/happiness-report/2018/WHR_web.pdf.
16. Cheten Dema, Veelash Mongar, Sangay Zangmo., et.al. Feasibility study to eradicate poverty in Bhutan through ICT, *IEEE*, (2018). <https://doi.org/10.1109/UPCON.2017.8251072>
17. Neal, Latoya O, Timothy, Coleman Shelia, M Hale. *Technology and Youth: Growing Up in a Digital World*, , ISBN : 978-1-78560-265-8, vol-19, (2015), <https://doi.org/10.1108/S1537-4661201519>
18. <https://www.gov.bt/covid19/wp-content/uploads/2021/01/Mega-zone-Description.pdf>