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Contesting Gross National Happiness in the Context of the Digital: *The Digital and GNH Divide in Bhutan*

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Abstract: Digitalisation has transformed the lives of millions of individuals, societies and governments globally by creating an impact on political, social, economic, cultural and environmental conditions of human existence. Through the use of information and technology, people have expanded their knowledge base, transparency in the government has been greater than ever before, and economic development has been amplified. Although varying in availability, affordability, accessibility, and technological know-how, most governments of the world have adopted the digital in some ways, of which, Bhutan is no exception. Since the inception of the first radio station in 1973 to the launch of its first nanosatellite (BHUTAN-1) in 2018, the country has made remarkable digital transformation. As a matter of fact, Bhutan's narrative of development through the use of the digital founded on the four pillars of Gross National Happiness (GNH) has caught the attention of the whole world. Placing people at the center of its development efforts, the convergence of the digital and development to enhance GNH, over the years, has influenced all aspects of Bhutanese life. However, everything comes with a price, digitalisation involves risks for the people and natural environment, thereby, compromising the very foundation of GNH philosophy. Therefore, the purpose of this paper is to assess and evaluate the impact of digital upon the GNH of Bhutan, with a special focus on environmental conservation as one of the pillars of GNH.

Keywords: Digitalisation; ICT; GNH; Environment; Carbon neutrality.

Introduction

Digitalisation, a mega trend in the world today has brought unprecedented changes in all segments of society, accelerating in all sectors such as social, political, economic, cultural, and environmental, thereby penetrating into all works of life. It has led to profound changes in every aspect of our lives through the use of digital technologies by integrating them into all organizational areas that fundamentally change how organizations operate, a process referred to as Digital Transformation. Digital transformation, therefore, implies the ability of firms and stakeholders to take full advantage of digital technologies in their fields (Komarčević et al., 2017). It has facilitated the production process, the way people interact with the environment, and accordingly has transformed the lives of millions of individuals, societies and governments globally. We have already entered into the second wave of digital transformation i.e., the Fourth Industrial Revolution, which according to Klaus Schwab (2017), is dominated by Artificial Intelligence, the Internet of Things, 3D Printing, data analysis and automation and energy storage and other technologies that has a tremendous impact upon the world today.

There have been several debates on the environmental impacts of Digitalisation, and whether digital transformation stalls or furthers environmental conservation has been a debatable issue amongst many scientists, researchers and academicians. On the one hand, the advent of Digitalisation has played a very important role in understanding and enabling responses

to environmental problems and managing environmental sustainability. For instance, the use of AI, mobile, Internet of Things and cloud computing have often helped to collect information on the distribution of resources and the environmental impacts of economic activities, increasing production efficiency and detection and monitoring of environmental change. According to the Global e-Sustainability Initiative (GeSI)[1] study, the digitalisation of different sectors can play a vital role in reducing global carbon emissions by 12 gigatons by 2030. Digitally enabled lighting, logistics solutions could reduce CO_2e by 3.6 Gt and smart agriculture could save up to 2.0 Gt of CO_2e (GeSI, 2015). On the other hand, the increasing problem of segregating and disposing of e-waste, increasing digital carbon footprint, and overconsumption of energy are some negative impacts of Digitalisation that requires urgent attention and have been the topic of concern among many researchers and scientists. For instance, according to the Shift Project[2], digital technologies account for nearly 4% of total global carbon emissions (Hess and Geist, 2020). Therefore, one cannot deny the fact the relationship between the digital and the environment is quite complex.

As of now, several studies have been done on the environmental impacts of Digitalisation. For instance, Berkhout and Hartin (2004) have given us three environmental effects of Digitalisation, categorised under: Direct, Indirect and Structural/behavioural effects. Drawing on this literature, I have examined the potential environmental impacts of the phenomenon of digitalisation in the Himalayan Kingdom of Bhutan. Since Bhutan has followed a unique multidimensional developmental strategy of GNH and made the claim of 'remaining carbon neutral in perpetuity'[3], the country serves as a fascinating laboratory for studying the impact of Digitalisation within the framework of GNH and how it has been tailored to align with its carbon neutral claim. Nevertheless, since there is hardly any research conducted on the subject matter, an in-depth research is required in Bhutan to investigate the direct and indirect effects of Digitalisation upon the environment with a special focus on its GNH philosophy in order to validate its carbon-neutral claim. Therefore, the main focus of my paper is on addressing and assessing the potential direct and indirect effects of Digitalisation upon the environment in Bhutan in relation to its carbon-neutral claim within the framework of GNH.

The Digital Bhutan: Contextualising the Digital in the Kingdom of Gross National Happiness

Digital Transformation is the most overrated and overstressed term of this century. It has significantly impacted our lives, and the natural environment, changed the way we understand, observe, act and interact with the ecosystem. Today, almost all countries have adopted the digital, including Bhutan. However, unlike in many other countries, digitalisation in Bhutan is basically a new phenomenon. It is only recently that Bhutan came out of its isolation and opened up to the rest of the world. Until the mid-1960s, Bhutan was a non-monetized economy, isolated from the rest of the world. Bhutan has now come a long way since 1963 when the first telecommunications network was initiated to ensure the modern economic development of the country. Now the country has well recognized the potential of digital technologies in promoting and enhancing its GNH-infused developmental philosophy. To make sure that Bhutan is on the right side of the global digital divide, the country has, over recent years, designed and implemented several policies, programmes and strategies to use ICT in order to create a '*knowledge-based society*'[4]. However, digital transformation involves challenges for the people and the environment such as the risks of the internal digital divide, threats to the ecosystem, increasing e-waste, and reduced access to government services due to digital illiteracy, all of which are antithetical to the very foundation of GNH philosophy and its carbon neutral claim. Therefore, the present paper attempts to explore the potential impacts [direct and indirect] of

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1 GeSI is a strategic partnership of major ICT sector and organisations around the globe that is committed to creating a sustainable world through responsible, ICT-enabled transformation.

2 The Shift Project is a French nonprofit that aims to achieve a carbon free economy by influencing and informing the debate on energy transition in Europe.

3 In December 2009, during the 15th session of the CoP, Bhutan pledged to the community that it will remain carbon neutral in perpetuity and issued a declaration entitled *'Declaration of the Kingdom of Bhutan- The Land of Gross National Happiness to Save Our Planet'.*

4 According to the Ministry of Information and Communications (MoIC), which is the nodal agency that looks after the overall development of ICT infrastructure and services in Bhutan, it is the policy of Bhutanese Government to create an ICT enabled knowledge society as a foundation for GNH.

digital transformation upon the operationalisation of GNH philosophy in Bhutan with primary emphasis on its impact on its carbon-neutral status.

Milestones in the development of the Bhutanese ICT Industry

1963: First telephone system launched.
1973: Commencement of Radio broadcast
1986: Bhutan Broadcasting Service radio service launched.
1994: International and domestic calling was made possible.
1999: Internet and television introduced.
2000: First fully state-owned Telecom Operator Bhutan Telecom came into existence.
2002: Bhutan Telecom received the first cellular mobile license.
2003: First mobile service communication was launched.
2006: Bhutan Information Communication & Media Act was passed.
2007: LAN implemented in all 20 Dzongkhags.
2014: Bhutan e-government Master Plan launched; Google Apps deployed for government use.
2015: Thimphu Tech Park launched
2018: Digitalisation of cable TV.
2019: Bhutan NetCom was inaugurated as the first Multi-Service Operator in the country.
2022: The Government Technology (GovTech) Agency[5] was launched.

Source: Kezang and Whalley(2009)*, Kuensel*(December, 2022).

Bhutan, being a small Himalayan country landlocked between China in the North and India in the west, south and east has a population density of only about 20 persons per square km. Recently the country has made a very bold and global claim of being a carbon-neutral state. Definitely, the term carbon neutrality has been defined in numerous ways[6], but in the case of Bhutan, it implies neutralising greenhouse emissions with forest-based carbon sequestration (Yangka et al., 2018) The Constitution of Bhutan mandates the country to keep 60 per cent of forest cover, and as of 2023, has a percentage of 69.71 i.e., 2.68 million ha of the total land area (RGoB 2023). Bhutan has been recognised as one of the ten global biodiversity hotspots, for the conservation of biodiversity, potentially the last chance for conservation in the Eastern Himalayas (Lhamu et al., 2000). Altogether, Bhutan is very rich in ecological diversity and has been successfully conserving it for centuries.

His Majesty, the Fourth King Jigme SingyeWangchuk had made it clear that the traditional method of measuring human progress through the instrument of GNP is inadequate in addressing the concept of happiness. It is necessary that both economic and spiritual aspects develop together. That is how the concept of GNH as a multidimensional developmental strategy came into force in the late 1980s (Givel and Figueroa, 2014). Although there is no direct source citation, the earliest reference to GNH apparently appears in an interview between His Majesty, the Fourth King Jigme SingyeWangchuck, a young king of one of the smallest and poorest countries of the time and a group of Indian journalists at the Bombay airport in 1979 where he used the term 'GNH' 'by chance' (Correa, 2017) and said 'we do not believe in Gross National Product, Gross National Happiness is more important'[7]. The King proclaimed that development in Bhutan would acknowledge, apart from economic needs, social, emotional and spiritual needs as well. GNH is a counterpoint to Gross Domestic Product[8] and may be defined as a multidimensional development philosophy of Bhutan that seeks to maintain balance between "spiritual, emotional and cultural needs on one hand and material wellbeing of the society on the other" (RGoB 2002). GNH has been constructed with

[5] The Government Technology (GovTech) Agency is mandated to carry out the functions related to information, communications and technology and establish a technologically efficient and effective government.

[6] The Paris Agreement which was adopted in 2015 with a goal to combat climate change brought into prominence the concept of Carbon Neutrality into the political agenda of many countries in the world. Carbon neutrality, in definition, is a concept that describes a process whereby GHG emissions produced by one or in one place are taken off or offset by emission reduction by another or another place. The Inter-Governmental Panel on Climate Changealso defines carbon neutrality as the state of balance between the anthropogenic emission of carbon dioxide into the atmosphere and the carbon dioxide removed from the atmosphere through carbon sequestration.

[7] See https://earthjournalism.net/stories/the-story-of-a -king-a-poor-country-and-a-rich-idea for full article.

[8] The Government of Bhutan regards GDP-centered development inadequate as it does not incorporate values such as sustainability and emotional wellbeing.

four integrated pillars: *good governance, sustainable socio-economic development, cultural preservation and environmental conservation*, and expanded into 9 domains. These nine domains include: psychological well-being, health, education, time use, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience and living standards. These nine domains are further expanded into 33 indicators with over 120 indicators, all of which are operationalised into policy making (Schroeder, 2018). The GNH index was adopted by the Royal Government of Bhutan in November 2008 as a part of 5-year national planning, which seeks to measure human well-being and government performance towards achieving GNH (Wangmo and Valk, 2012). It attempts to measure how well the citizens are doing socially, emotionally and economically. It was developed by the Centre for Bhutan Studies[9] with the sole purpose to evaluate the Bhutanese progress of happiness and well-being through policy making. Additionally, developed by the CBS and GNHC[10] are the 26 screening tools through which every policies and legislation must pass.

Article 9(2) of the Constitution of Bhutan states that the 'state shall strive to promote those conditions that will enable the pursuit of Gross National Happiness'. Accordingly, policymaking in Bhutan has to align with GNH principles. Though the concept of GNH has still not been clearly defined, the Royal Government apparently claims to keep people at the centre of its development efforts. However, along with the rapid digital transformation, new digital divisions between the physical and natural environment continue to emerge owing to rugged topography, limited capital, inadequate infrastructure and lack of adequate research and data that has had a tremendous impact upon not only the Bhutanese population but also upon the environment, thereby challenging its very claim of carbon neutrality.

The Digital and GNH Divide: A Threat to the Claim of Carbon Neutrality?

The Royal Government of Bhutan has outlined three main areas for achieving its ICT objectives as a foundation for GNH:

1. ICT for Good Governance
2. ICT for a Bhutanese Information Society
3. ICT as a key enabler for Sustainable Economic Development (RGoB 2014).

Digitalisation can become a challenge to the GNH goal of sustainable development if it is not employed properly. The 'Bhutan ICT Policies and Strategies (BIPS)' which was launched in 2004 is the main policy document that promotes ICT development in Bhutan and one of the strategies of BIPS is to ensure *"sustainable and appropriate ICT infrastructure"* which includes exploring the ways of reducing ICT hardware and software; and recycling (RGoB 2004). Guided by GNH philosophy, 'Bhutan E-government Master Plan (2014)' also prioritizes preservation of environment as an important part of information society upholding one of the pillars of GNH (RGoB 2014). In the same manner, the 'Bhutan Telecommunications and Broadband Policy' of 2014 that recognises telecommunications and broadband as the foundation of information society, provides principles and directives to develop the sector including e-waste management and energy efficient technologies. Although these policies have been formulated with the GNH framework, but in reality, no serious effort has been made whatsoever to understand the intensity of the environmental impact of digitalisation in carbon-neutral Bhutan. The Kingdom still lacks an independent and comprehensive policy for achieving this goal. For instance, there is no independent policy in Bhutan that deals with e-waste. The Royal government should impose regulations on every individual involved in production, sale, buying, refurbishing, disassembling and recycling of e-waste. The government in partnership with the private sector should strengthen mechanisms and regulations to ensure proper e-waste disposal and recycling. Moreover, as a result of the impacts that digitalisation have upon the natural environment, digital services should be included as one of the domains with the environmental conservation pillar of the GNH framework.

Following are the potential indirect/positive and direct/negative impacts of Digitalisation in Bhutan that have direct impact upon the GNH.

Indirect/Positive Impacts:

1. One of the main objectives of the Bhutan Telecommunications and Broadband Policy (2014) is to create an affordable broadband and telecom services so as to increase connectivity and inclusion. According to the nationwide ICT

[9] The CBS is a think tank, an autonomous research centre that works closely with the Gross National Happiness Commission (GNHC) that conducts GNH related research and surveys.

[10] The GNH Commission is the apex body for implementing five-year plans in Bhutan. The Commission is charged with ensuring that GNH principles are mainstreamed into all policies and programs using the CBS's GNH Index.

household survey conducted by the Ministry of Information and Communications in 2021 (RGoB 2021), about 90.7% of rural households and 99% of urban households own a smartphone and around 89.7% of all households have access to 4G internet service. Therefore, increased coverage has minimized the internal digital divide that has led to increased dissemination of knowledge and access to information, and thereby, increased awareness among the population on issues concerning the environment such as biodiversity and climate change.

2. Digitalisation has enhanced environment information management and enabled ministries and agencies to assess and understand the environmental problems and impacts of climate change which has consequently shaped their policies and programmes to tackle such problems. For instance, the Ministry of Energy and Natural Resources (MOENR) has integrated with the Climate Action Data Trust (CAD Trust)[11] Metadata Layer in order to provide transparent data on climate mitigation efforts using advanced database mechanism.
3. Online newspapers and magazines that have been introduced [such as Kuensel Online, and Bhutan Times] are cheaper and easily accessible. It has contributed to a great extent in reducing the cost of production and lessened the use of paper and energy consumption, thereby upholding the environmental conservation pillar of GNH.
4. Increased Digitalisation of production processes in Bhutan has diversified its economy and extended its market on the global space. It has enhanced the efficiency of production and distribution of goods and services through e-commerce which, through its low costs and greater flexibility, has enhanced the process of sustainable development[12]. Moreover, remote delivery of goods and services can reduce transportation costs and minimize energy consumption.
5. Buddhism forms the basic feature of Bhutanese society. Environmental conservation, which is one of the four pillars of GNH, has been designed following the Buddhist teachings and maintains that it is crucial that all four elements of nature (earth, water, air and fire) maintain balance in order to ensure the wellbeing of all sentient beings. Digital transformation in Bhutan has played a vital role in harnessing and preserving its unique culture. It has disseminated knowledge about different communities and contributed to the preservation and transmission of Bhutanese culture on a global scale. For instance, the Dzongkha[13] machine translation system was launched in Bhutan in 2023 to boost the usage of the national language with the help of technology.
6. One of the most important indirect effects of digital transformation in Bhutan has been its ability to use different technologies such as the Internet of Things to predict and mitigate the effects of natural disasters through data collection and analysis. Digitalisation has allowed Bhutan to preserve the environment by allowing different agencies to monitor forest coverage, environmental abuses such as poaching and illegal trade. For instance, the Royal Manas National Park which is under the Department of Forests and Park Service started using SMART (Spatial Monitoring and Reporting Tool[14]) with the aid from the World Wide Fund (WWF) in 2013, and as of 2024, the technology covers over 1200 sites throughout the country.

Direct/Negative Impacts

1. Almost every ICT device uses elements such as batteries, LCDs, semiconductors etc., and such devices have a short life span and contains hazardous elements and this implies a considerable increase in e-waste (Truong, 2022) that is released into the environment. As per the 2019 National Waste Report (RGoB 2019), the total E-waste generated

[11] Climate Action Data Trust (CAD Trust) is a global metadata platform introduced by the World Bank, the International Emissions Trading Association (IETA), and the Government of Singapore. It uses advanced database mechanism to **facilitate transparent accounting in** carbon markets in line with the Paris Agreement.

[12] As of 2023, there are 107 registered e-commerce business, out of which 52 are fully active (**Lhamo,** 2023; para 2)

[13] Dzongkha was made the national language of the country by a Royal decree in 1971. English is the language of education and administration.

[14] The SMART platform is a set of software and analysis tool that is designed to help conservationists protect wildlife and wild places. SMART collects, analyses and shares the data from the site and also analyses poaching trends to enhance the effectiveness of the rangers by identifying high-risk areas.

in the entire Kingdom was 1032.8 tonnes i.e., 1.6% of the total waste[15]. Moreover, there has been a lack of proper waste management and disposal methods throughout the country. According to the GNH survey (2016), 4.57% of the rural population and 9.6% of the urban population were affected by inadequate waste disposal sites. As mentioned above, the Royal Government lacks an independent e-waste policy to regulate the generation, collection and recycling of e-waste in the country.

2. Internal digital divide has contradicted the philosophy of GNH. There is a disparity in the availability and accessibility of digital services in many parts of the country. Only about 34% of all individuals have the ability to operate a computer and 21% of the households were not able to access the internet due to poor network connections in their areas (RGoB 2021). This implies that digitalisation has not reached every part of the population; there is an anomaly in the dissemination of information in creating awareness among the people regarding environmental conservation. Thus, one of the policy objectives of the BIPS to make the government more inclusive and efficient to achieve the GNH goals through the use of ICT is yet to be achieved.
3. One of the most important direct impacts of digitalisation in Bhutan has been the growing energy[16] consumption which further impacts the environmental prospects of the country. According to the *Environmental Accounts Statistics* (RGoB 2023) gross domestic consumption of electricity increased from 385.62 in 2021 to 537.92 (GWh) in 2022 and the industrial consumption increased form 2,325.61 in 2021 to 3,116.08 (GWh) in 2022. Availability of electricity in future can only be guaranteed through quality ICT infrastructure and this is a matter of serious concern for a country that has made the commitment to remain carbon neutral in continuity.
4. It is to be noted that the use of digital comes with a carbon cost. Harvard Professor, Dr Alex Wissner-Gross suggested that searching a website once produces on average 20 milligrams of CO_2 (Miguel 2009, para 2). Although the process of digitalisation in various organized sectors has increased efficiency in production and distribution services, there has been an increase in the emission of greenhouse gases which directly threatens Bhutan's carbon neutral status. According to the *Third National Communication Report* (RGoB 2020), energy emission from the transport sector is highest in Bhutan with 60.1%, followed by manufacturing industries with 34.3%. Bhutan's carbon sink, estimated at 6,309.6 Gg CO2e, will be surpassed in the BAU Scenario in the 2035-2040 period, putting the country's Carbon Neutral status at risk.

Conclusion

All of the above mentioned effects of digitalisation have direct implications upon GNH. Although the Royal Government has recognised the need for accountability, transparency and integrity in its digital services in its E-governance Policy (2019) and the Revised Bhutan ICT Roadmap (2015), it still has a long way to go. One of the main objectives of the Thirteenth Five Year Plan which is scheduled to be operative from July, 2024, is to adopt 4IR technology into various policies, infrastructure, and logistics and to promote Digitalisation and digital services (Zangpo 2024,). The greatest challenge ahead for Bhutan is achieving the right balance between digitalisation and its claimed carbon-neutral status. The Government should focus on increasing investments in climate-friendly technologies. In a study by Lopez et al. (2011), it was shown that the more the government spends on areas such as environmental protection and technology, the less direct negative impact it will have upon the environment. However, the budget appropriation decreased from 2,111.565 (nu. in millions) for the financial year (2022-2023) to 1,785.895 (nu. in millions) for Communications and Technology sector for the financial year (2023-2024), this constitutes only around 2.1% of the total allocation, which is, in fact, quite less compared to other departments.

Bhutan has taken several steps to infuse digital into the GNH framework in order to uphold and enhance its carbon-neutral status. The Economic Development Policy (2016) provided incentives such as tax rebates to industries adopting environment-friendly technologies. The Bhutan Electric Vehicle Roadmap has also been

[15] National Statistics Bureau conducted first ever nationwide National Waste Inventory survey in 2019 covering all the waste generating sectors.

[16] The main sources of energy in Bhutan are: electricity, coal, fuelwood, diesel, LPG and petrol. (RGoB 2023)

developed to achieve zero emission mobility for 2035, 2045 and 2050. The Kingdom has also aligned with the Climate Technology Centre and Network (CTCN)[17] of UNFCCC to facilitate a workshop to learn about the experiences of Thailand in Bangkok and Chiang Mai regarding public and intelligent transport systems and have knowledge of the relevant technologies.

The Nationally Determined Contribution (NDC) of Bhutan claims that the Kingdom '*maintains the commitment to remain carbon neutral*' (RGoB 2021). Although the Greenhouse Gas Inventory of Bhutan has been improved to a significant extent, it does not cover any data to help us understand the potential impacts of digitalisation on the environment, thereby making its carbon-neutral claim rather ambivalent. All that data that the Royal Government has on the Kingdom's access to digital goods and services, but data such as the amount of CO_2 emissions from the production, use and disposal of such digital technologies is still unavailable in the public domain. This has been the most critical constraint in contextualizing its carbon-neutral claim with the GNH framework. However, it cannot be denied that if the process is duly aligned with the GNH goals, the country may be able to thwart unwanted environmental outcomes of digital transformation aforementioned such as the environmental consequences of the digital divide, e-waste, and promote sustainable economic development and alongside; substantiate, uphold and promote its carbon neutral claim. Bhutan should, thus, expand its regulatory framework to address the environmental challenges of digital transformation in light of the overarching goals of GNH.

Conflict of Interest

The author declares no conflict of interest or personal relationships that could have appeared to influence the work reported in this paper.

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[17] Climate Technology Centre and Network (CTCN) is the operational arm of UNFCCC Technology Mechanism that accepts requests from developing countries to reduce the risk and cost of environmentally sound technologies to enhance low-emission and carbon-resilient development.

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