

Favoring technocentrism over ecocentrism evidence from Finland and Bhutan



Doaa M. Salman^{a*}, Merna Nagy^b

^a Professor of Economics and Finance, Head of economics department, Associate Dean, October University for Modern Sciences and Arts, Egypt

^b October University for Modern Sciences and Arts, Egypt

ARTICLE INFO

Article history:

Received 19 May 19

Received in revised form 28 June 19

Accepted 07 July 19

Keywords:

Technology,

Environmental degradation

Ecocentrism,

Technocentrism

JEL Classification:

O13

O140

I310

ABSTRACT

Ecocentrism places the ecosystem at the center and stress that we need to limit our natural resource exploitation, so that we can conserve the environment and prevent its destruction. Technocentrism, on the other hand, focuses on technology and science as a way to repair any damage done to the environment rather than changing ethical perspectives on environmental issues. This paper seeks to explore the two ideologies by comparing between Finland and Bhutan; two countries that seem to resemble the two approaches. Finland is considered one of the highly technologically advanced countries, in addition to its reputation for environmental protection. Bhutan is a Himalayan Kingdom that is known for its strong environment conservation and their intriguing approach to sustainable development. The paper compares between the two countries sustainable development approach, environment, and health. It was concluded that, in terms of the environment; Bhutan is doing much better than Finland. Finland's carbon emissions reduction was mainly because they produce goods in other countries which increase the other countries emissions not Finland.

© 2019 Bussecon International Academy. Hosting by Bussecon International. All rights reserved.

Peer review under responsibility of Bussecon International Academy.

1. Introduction

Among the most complex and controversial topics nowadays is environmental degradation. Over the years, Economists have been examining and debating the relationship between human and economic activities, and environmental degradation. It is widely believed that the rise of industrialization throughout the globe and the extensive extraction and use of natural resources has causes plenty of environmental issues such as global warming, air pollution, water pollution, biodiversity decline, and climate change. All these problems have resulted in, not only environmental deterioration but also major health consequences to mankind. Even though some argue that climate change and species extinction are completely normal and that over the course of history the planet has gone through major changes prior to the existence of the human race, it is generally believed that human activities have accelerated and accentuated these environmental deterioration.

Most countries sacrifice with the environment for the sake of economic development and economic wealth. When observing the world's most powerful and most developed countries, they tend to be highly industrialized and manufacturing dependent. As for developing countries where the poverty rates and

* Corresponding author. Tel.: +0-20-1006-179-666; ORCID ID: 0000-0001-5050-6104

E-mail address: dr.doaasman@gmail.com

Peer review under responsibility of Bussecon International Academy.

© 2019 Bussecon International. Hosting by Bussecon International. All rights reserved.

<http://dx.doi.org/10.36096/brss.v1i1.98>

corruption rates are soaring, it is exceedingly challenging to raise awareness about the environment especially since these countries tend to look up to developed countries and mimic their activities in order to reach the same level of success. However, many countries have realized what their economic operations have resulted in and are attempting to modify their actions in order to save the environment but the challenge is tough as the damage is enormous. Among the commonly used tactics is increasing manufacturing and industrialization as a way to boost the economy and when the economy is on its feet, the countries would compensate for the environmental damage done.

The purpose of this paper is to examine the two opposing views of ecocentrism and technocentrism. Is it true that technology can solve environmental problems or do we need to pay more attention to sustaining ecology to have a balanced environment? The countries chosen for comparison are Finland and Bhutan. The reason behind the choice is the fact that Finland is considered among the world's cleanest and most environmentally friendly countries, in addition to being technologically advanced. As for Bhutan, it is a very small country that is not technologically advanced but has a compelling and intriguing approach about sustainable development and economic growth. The paper will first go through some concepts and factor of environmental degradation and sustainability in the literature review, followed by the comparative study between Finland and Bhutan.

2. Literature review

2.1. Factors and Health Consequences of Environmental Degradation

Resource depletion and environmental contamination are usually sensed locally; however, they are the main drivers of global environmental degradation. This environmental damage is linked to economies that are profit-oriented, growth-driven, and consumption driven. Due to the unsustainable industries the global environmental landscape has been negatively affected. This destructive path has been driven mainly by global capitalism (Hodgson, 2017). Additionally, there is a link between consumption and production consequences. For instance, individuals purchasing inexpensive electronics or clothing in Barcelona, for example, may not be activity participating or even aware of the human and environmental violations involved in the production process in Bangkok. Furthermore, environmental costs such as air pollution, soil contamination, water contamination along with social costs such as labor exploitation are rarely reflected in the production costs (Hodgson, 2017). Since Businesses' profits are not directly affected by the contamination or depletion of natural resources, they have no reason to prevent production processes that are harming the environment. According to Hodgson (2017), more than eighty-five thousands new industrial chemicals have been released into the environment and produced with government oversight or minimal testing. Even with the awareness of the danger environmental and health consequences of these chemicals, they are only regulated in high-income countries; however, they are still being exported to be used in production in lower and middle income countries that have few or no regulations.

Toxic wastes are major factors of environmental contamination as they are by-product of industrial production. Conventional and nuclear weapons testing, production, and storage are responsible for toxic chemicals that are linked to increasing rates of cancer and decreasing life expectancy in populations living nearby munitions factories and military bases in the United States and Russia (Hodgson, 2017).

Mobile phones, computers, electronics, and household appliances wastes are referred to as electronic waste or e-waste result in air and soil contamination with mercury, lead, and other metals.

The use of pesticide application on a massive scale and the wasteful irrigation practices in the agricultural sector result in groundwater and soil contamination as well as wasting valuable water resources. In addition, the massive pesticides usage effect the health of farmers, since there are no adequate protection a huge number of fatalities and poisonings is recorded each year (Hodgson, 2017). One of the world's most profitable yet most destructive industries is the mining industry. Be it gold, cobalt, uranium or any other metal it has major environmental damages including deforestation, the leakage of heavy metals and acids into the water and the soil, and greenhouse gases (Hodgson, 2017). Whenever we mention the forces driving environmental degradation and climate change, the energy sector is top on the list. The extraction, refining as well as distribution of oil, coal, and natural gas cause major environmental harm. The oil extraction process is dangerous due to the high chances of collision-related fires, leaks, spills, carbon dioxide emissions, and methane. Also, chronic bronchitis, cancer, blood disorder, and asthma are linked to natural gas emissions. In Alberta, Canada the process of converting raw bitumen from tar sands to crude oil results in carbon dioxide emissions and dangerous chemicals that increase cancer rates in near-by communities as they accumulate in the food chain, threatening those who rely on fishing and hunting (Hodgson, 2017).

2.2. Sustainability

Sustainable development has been widely presented as three sectors including the economy, environment, and society. The model is represented as three equal sized interconnected rings that intends to balance the three sectors together and reconciles conflicts (Giddings, Hopwood, & O'brien, 2002). However, the assumption that these three sectors are separate is one of the major weaknesses of the model as this approach risks dealing with sustainable development issues in a compartmentalized way. This separation underestimates the major connections between the environment, economy, and society and results in trade-offs between them and usually governments focuses more on the economic sector compared to the environmental and social sectors (Giddings, Hopwood, & O'brien, 2002). No matter how much humans try to replace biodiversity with genetic engineering, build sawmills as forest substitutes, or find a replacement for the ozone layer, they will not be able to as it would be technically troublesome.

Furthermore, a technical fix approach is encouraged by the three sectors separation which focuses on greenhouse gas trading, taxation, pollution control, lower resource use instead of the viewing the deeper issues and links between economy, society, and environment. The Sustainable development agenda often miss the roots of the problems and fail to ask the critical questions of how decisions should be made, whose interests does it serve, and what policies should prioritized (Giddings, et al. 2002). On the other hand, an interconnected approach between human activity and well-being within the environment

where the well-being of humanity is dependent on the environment, as the environment would survive without humans but humans would not survive without, is considered a better approach. This integrated shift would encourage a win-win situation (Giddings, et al. 2002). For example, shifting to renewable energy would benefit both the environment as well as human well-being.

2.3. GDP Criticism

Throughout the years, the changes of a country's Gross Domestic Product (GDP) have been generally accepted as a measure of economic development and economic progress (Costanza, et al. 2009). It measures the value of all services and goods traded during a certain period of time; it is calculated by adding government expenditure, private consumption expenditure of households, net exports which is the difference between exports and imports, and net capital formation. GDP is considered a way through which economic activity is measured but not economic or social well-being, this does not mean GDP is inherently bad, but it is somewhat misused (Costanza et al., 2009). One of the main problems of GDP is that it measures the monetary transactions only, which is an incomplete picture of the economic system within which humans operate. A more precise picture should include the social and environmental systems upon which the economic system depends on. In addition to the natural capital available, the quantity as well as the quality of human capital greatly affects the economy. This means that by ignoring changes in these components, key aspects of the quality of life is not measured and it may hinder the community well-being on the long run (Costanza et al., 2009).

Furthermore, the measurement of GDP is believed to encourage and accelerate the natural resources depletion. For instance, cutting down a forest and utilizing the wood in production increases the GDP. This is done without taking into consideration the forest value in terms of its ecosystem services such as; flooding reduction resulting from severe storms, biodiversity habitat, improving the quality of water in lakes and rivers, oxygen production, and carbon dioxide intake. All these ecosystem services are not included in the GDP as they not considered a factor of the market economy. Moreover, the threshold effect has raised more concerns regarding the GDP measurements. The threshold effect is basically the idea that as the GDP increases so does the quality of life but up to a certain point (Costanza et al., 2009). After this point, any increase in GDP is cancelled out by the increasing costs linked with loss of leisure time, income inequality, and natural resources depletion. Various researchers have found that if the material well-being increases above certain threshold, multiple negative effects are observed including lower levels of healthy relationships, knowledge, sense of purpose, wisdom, connection with nature, community adherence, and other human happiness dimensions. The consequences of lower levels of these psychological dimensions results in a rise of social pathologies such as rates of divorce, suicide, depression, alcoholism, crime, and poor health (Costanza et al., 2009).

2.4. The Ecocentrism View

All natural resources are valuable and essential even if humans do not find them of value, the intrinsic value of all natural resources goes beyond their ability to satisfy humanity's needs; this is known as the concept of deep ecology which is the core of ecocentrism (Emetumah, 2017). Since humans are part of nature, they have a moral duty towards environmental resources as they are the main custodian. Additionally, combining all ecosystems on the planet into a universal wholesomeness and sustaining them will help in maintaining the equilibrium of the environment. This means that each individual ecological unit is essential in balancing the entire environment. Ecocentrism aims at rising awareness that humans are only a biotic factor who must follow the laws of ecology. Furthermore, ecocentrism stresses the need for setting limits to humanity's rights over natural and environmental resources in order to conserve and protect the environment from destruction. However, these principles are quite hard to apply in real life, especially in developing countries where there is corruption, high levels of poverty, and unemployment (Emetumah, 2017).

2.5. The Technocentrism View

Technology has affected our everyday lives since it is easily accessible and more convenient. Environmental management has also been greatly influenced by technology. Technology has not only provided solutions to environmental problems, but also played a crucial role in creating environmental awareness. This means that technology will most likely continue to affect environmentalism in the twenty-first century. Due to the anthropocentric tendencies of technocentrism it is often labeled as shallow ecology. The belief that science and technology are always capable of solving environmental problems is the center of technocentrism and it does not aim at changing ethical perspectives on environmental issues (Emetumah, 2017). In addition, Ecocentrism, unlike technocentrism, believes that economic, political, and social modifications are more relevant for facing environmental challenges. On the other hand, technocentrism views these modifications as far-fetched and firmly believes that science along with technological advancement is all we need to protect the environment. However, green technologies that are environmentally friendly and cause no or little pollution are supported by ecocentrism as it is not against technology completely (Emetumah, 2017).

2.6. Technology Idealization

Nowadays, most technological solutions and advancements are highlighted as genius and brilliant but we rarely see any criticism of technological solutions, even if there is, it is usually disregarded. When observing the American society; for instance, there is splitting in the way technology is viewed (Heller & Kaminstein, n.d.). A simple example is people perspective on liquid anti-bacterial soaps that kill a large number of bacteria and how it is marketed on the basis that we need it to fight viruses. Development of a technological solution that fights more germs is perceived as clean and desirable, on the other hand, criticisms on how this can create problems is dismissed and thought of as unclean and destructive. On the contrary, the perspective is reversed in Hollywood movies as technology is usually pictured as evil and inhuman. This disparate and separation in perspectives is so extreme which indicates the splitting

dynamics, where we are unable to consider both the advantages and disadvantages simultaneously (Heller & Kaminstein, n.d.). The splitting phenomenon and how it is becoming extremely difficult for us to critically evaluate, set boundaries, or even reject some new technologies is illustrated in various examples. For instance, a book was written about computer revolution downsides, where a conversation was raised about how it might take away our privacy safeguards, cause unemployment, and allow more negative control from bosses over their employees. Even though the book was well-received in Japan and sold well, it was greatly ignored and overlooked in the United States. In fact the demand for faster communication systems, computer, airplanes, better pesticides, better fertilizers, and faster-acting drugs is increasing without even wondering or questioning whether it is a good thing or not, and without considering the negative effects of some of these complex substances (Heller & Kaminstein, n.d.). The society seems to turn a blind eye to the dangers associated with technological advancements. Additionally, we fail to acknowledge the downsides and benefits of current as well as new technology. We tend to fix any technological problem with another new technology. For instance, increased globalization and rapidity of communication, causes people's lives to move at blinding speeds, in order to solve this problem, people resort to drugs that help them function with little sleep or drugs that keep them more alert and faster, in order to keep up. However, society rarely question if the communication rapidity is helping our progress, work, or happiness or hindering them (Heller & Kaminstein, n.d.).

3. Economic background

3.1. Finland

Finland is located in Northern Europe, bordering the Baltic Sea. According to the World Development Indicators, Finland has a population of approximately 5.5 million and its surface area is equal to 338,450 square kilometer in 2017. The country has one of Western Europe highest per capita income. The country is also known for its high quality education, and equality advocating (Central Intelligence Agency, 2019). Finland economy is highly industrialized and diversified, and its exports contribute to almost one-third of the GDP. Manufacturing of wood, telecommunications, engineering, metals, and electronic, are among the industries in which Finland has competitive advantage. Additionally, the country promotes startups in clean-tech, biotechnology, information and communication technology, gaming that is why it excels in technology exports. On the other hand, the development of the agriculture sector is limited due to the cold weather (Central Intelligence Agency, 2019).

3.2. Bhutan

Squeezed between Asia's two giants India and China, Bhutan is a tiny landlocked Himalayan Kingdom. Bhutan is known for its distinct Buddhist cultural heritage and unspoiled natural environment (Frame, 2005). The country has never been colonized and until the 1960s it remained isolated from the rest of the world. With a population of 807,610 and surface area of 38,394 square kilometer in 2017 (World Development Indicators), Bhutan is considered one of the smallest countries. However, Bhutan is currently among the fastest growing economies worldwide. Between 2007 and 2017 its annual average economic growth rate was 7.6% which is greater than the global average growth rate of 3.2% (Lhaden, 2018). Eradication of extreme poverty was a major consequence of this high growth rate, according to the international poverty line of \$1.90 a day (at PPP), poverty declined from 8% in 2007 to 1.5% in 2017 (Lhaden, 2018). Additionally, improvement in other basic services including education and health is also witnessed.

3.3. Tragedy of the Commons in Finland

In 1968, the ecologist Garret Hardin wrote the well-known article "The Tragedy of the Commons". The dilemma of the tragedy of the commons refers to a scenario where land is degraded as a result of livestock grazing by everyone in a community (Anukwonke, 2015). It is a principle embraced by the environmental movement. The principle states that when individuals behave according to their independent self-interest rather the best interest of the whole community, common resources become depleted. Commons refer to resources such as oceans, fish stocks, rivers, atmosphere, energy, other shared resources that are formally unregulated (Anukwonke, 2015). Finland, for example, is a forest-rich nation but the survival of its old-growth or ancient forests is jeopardized by industrial logging (Lindgren, 2003). Old-growth forests contain regionally, nationally, and globally high concentrations of rare, endangered, or threatened ecosystems and biodiversity values. Additionally, Biodiversity and traditional livelihood of people who herd reindeer are maintained by these forests, that is why conservationists and scientists call for increasing the protection levels of these old-growth forests. Nonetheless, these vulnerable and rare habitats are logged by the government because of large demand from the enormous international paper industry. Finland exports about quarter of the world's demand of writing and printing paper, the paper industry is thus fed by the Finish intensive forest industry (Lindgren, 2003). Consequently, forest thinning, fragmentation of natural habitats, and microclimate change result from destroying the country's forests. Recently, a new climate and energy strategy was announced by the Finnish government which includes increasing wood harvesting to around twenty-five percent which would reduce carbon sink and inhibit climate change improvement (Hassi, 2017).

4. Comparative study

4.1 Sustainability

4.1.1 Bhutan's Approach to Sustainable Development

Bhutan has a unique and fascinating approach to sustainable development which covers three main goals. These three goals include; wealth that is GDP, in order to provide employment opportunities and align with their middle income objective, Greenhouse Gases (GHG) which involves keeping carbon at a neutral level, and the countries well-known Gross National Happiness (GNH) index that contains the socio-economic targets (Yangka et al., 2018). Bhutan stressed that development must be socially, culturally, environmentally, and economically sustainable. Bhutan considers the GNH concept its own sustainable development version. When observing the first goal which is Gross Domestic Product, significant structural changes has been noticed. The percentage of contribution of the three major economic activities to GDP has shifted; for example, primary sector contribution, which includes agriculture, mining, and forestry, have declined from 56% to 27% between 1980 and 2003. While the secondary sector comprised of construction, energy, and manufacturing, raised from 11% to 41%, whereas 33% remained constant for the tertiary sector (Yangka et al., 2018). This means that Bhutan is moving gradually from a traditional agrarian and forestry-based economy to market based modern economy. Furthermore the growth rate of the country is extremely positive which suggests that the GNH philosophy has not restrained economic development (Yangka et al., 2018).

According to The Constitution of The Kingdom of Bhutan (2008), in order to prevent degradation and conserve the natural resources of the country, the government shall maintain at least sixty percent of the total land under forest cover. Additionally, protecting the natural environment, conserving the rich biodiversity, and preventing of all forms of ecological degradation such as physical pollution, visual pollution, and noise pollution is a fundamental duty of each and every citizen. Bhutanese citizens are considered the trustees of the countries environment and natural resources for present and future generations benefit. Moreover, culture and heritage of the nation shall be preserved, protected and respected by the Bhutanese citizens. Despite the country's little contribution to climate change, it has suffered from the threats imposed by climate change. For instance, incidences of glacier lake outburst floods have been witnessed in the past, and resulted in properties damage, cultivated agricultural land destruction, and loss of human lives (Yangka et al., 2018). This is why Bhutan has pledged to become carbon neutral, which is balancing carbon from inputs and outputs of a service or product with the carbon in the atmosphere (Yangka et al., 2018).

The Fourth King of Bhutan was the first to adopt and discuss the concept of Gross National Happiness (GNH), in the 1970s. The concept is based on a Buddhist philosophy which believes that beneficial human society development occurs when spiritual and material development improve alongside each other; reinforcing and complementing one another. The quality of a country is measured in a more holistic manner compared to GDP, according to this philosophy (Yangka et al., 2018). The GNH report includes variables based on both international standards and Bhutanese values and standards. A national level GNH survey was carried out on 2010 and 2015 by the Centre for Bhutan Studies in order to measure whether the happiness level is increasing. Results shows that the national level of the GNH index has increased by 1.8%, also results indicated that urban citizens were happier than rural citizens; however, the report suggests that all groups of people can be happy but there are differences in the levels of happiness (Yangka et al., 2018).

A low impact-high value approach was developed in Bhutan as a way of controlling mass tourism and protecting the environment from its negative and culturally destructive aspects (Jeffrey, 2013). This is done through controlled pricing, limiting the number of tourists as well as their entrance to certain location, all these measures limit negative impact. In addition, an eco-tourism industry is built around protected areas which guarantees the protection and conservation of landscapes and biodiversity that particularly captives the eco-tourists (Jeffrey, 2013). Nonetheless, maintaining biodiversity and protecting wildlife populations can sometimes lead to conflicts among the individuals living in protected areas. For instance, yak-herding communities are greatly affected and experience high losses by snow leopards which is a predator of yak. But herd insurance programs and community-based compensation from eco-tourism revenues, since these predators that are so appealing to eco-tourists, are used to bring benefits to these communities for their level of tolerance to these beautiful creatures (Jeffrey, 2013).

4.1.2. Finland's Approach to Sustainable Development

The 2030 Agenda for Sustainable Development was adopted by the UN Member States in 2015. The main aim is to eradicate extreme poverty worldwide and to ensure wellbeing in an environmentally sustainable manner. There are seventeen sustainable development goals included in the 2030 Agenda that should be met by 2030. Finland is committed to achieving these goals both nationally and internationally (Ministry for Foreign Affairs of Finland, n.d.). The seventeen goals are poverty eradication, zero hunger, well-being and good health, gender equality, quality education, sanitation and clean water, clean and affordable energy, economic growth and decent work, infrastructure, industry and innovation, inequality reduction, sustainable communities and cities, responsible production and consumption, combat climate change, sustainable life below water, sustainable life on land, strong and justice institutions, global partnership for achieving goals (Lyytimäki & Lähteenoja, 2016).

The Finnish government stress on the importance of mobilizing resources from technology, science, and innovation to support and reach these goals (Ministry for Foreign Affairs of Finland, n.d.). Furthermore, strengthening good governance and democracy, along with enhancing women rights are on top of Finland priorities. On the other hand, ecological footprint, climate change, and overconsumption are major issues in Finland that has resulted in biodiversity loss and unsustainable use of natural resources. Even though Finns are considered extremely environment-conscious, their natural resource and energy consumption are at highly unsustainable levels. However, the country has high potentials for exploring new solutions and implementing energy-conserving technology (Lyytimäki & Lähteenoja, 2016).

4.2. Environment

In order to compare between Bhutan and Finland in terms of environmental health, the following indicators were chosen.

4.2.1. CO2 emission (kt)

It is indicator which measures the emission of carbon dioxide from mainly from burning of fossil fuels and cement manufacturing. The figure shows that carbon dioxide emissions in Finland are significantly higher compared to Bhutan. In 2007, Bhutan’s carbon dioxide emissions were 392 (kt) while Finland’s carbon dioxide emissions were 63,986 (kt). Bhutan carbon emissions has been slightly increasing over the years; however, the emissions are not extreme as around 70% of the country is covered in forests which act as a carbon sink, absorbing great amount of the carbon dioxide produced (Tutton & Scott, 2018).

As for Finland, the emissions have been declining over the years mainly because of industrial processes improvements, waste treatment methods, and fuel use trends (Ministry of the Environment, 2014). Additionally, in recent decades the economic growth of Finland has been built on the use of natural resources in other countries. During the manufacture of imported goods, the environmental loads primarily impact their countries of origin, which helped decrease Finland’s emissions. Furthermore, the financial crisis in 2009, hindered many environmental policy processes, especially on climate change issues (Ministry of the Environment, 2014).

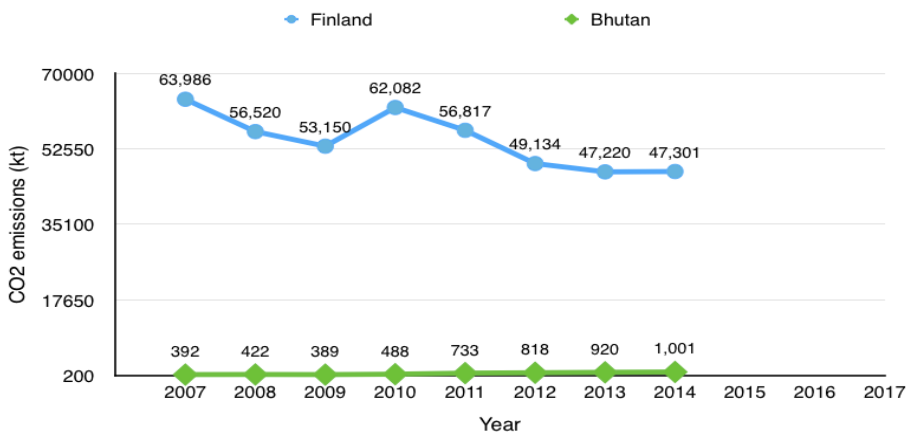


Figure 1: CO2 emissions (kt) of Finland and Bhutan. Source: World Development Indicators-The World Bank.

4.1.2. CO2 emissions (metric tons per capita)

Some argue that the country’s carbon dioxide emissions don’t provide us with the whole picture of a country’s global warming contribution. That is why it is important to consider the carbon emissions per person. For example in 2007, China’s carbon emissions exceeded that of the United States; but when observing the carbon dioxide per capita, Chinese were responsible for 4.6 tons while Americans were responsible for 19.8 tons (The Guardian, 2009). The figure shows that the carbon dioxide emissions in Finland are much greater than Bhutan. Between 2007 and 2014, the average carbon dioxide emissions in Finland were 8.2 metric tons while the average carbon dioxide emissions in Bhutan were 0.7 metric tons. Another layer of complexity is added when exports and imports are included in the equation. Many argue that it is unfair to only consider the location of production emissions. For instance, China generates great amounts of emissions from producing goods that are ultimately exported and consumed in rich and developed countries. So, if the exports of a country were excluded from its footprints and its imports were included, the results show that the developed countries are top on the list (Clark, 2011).

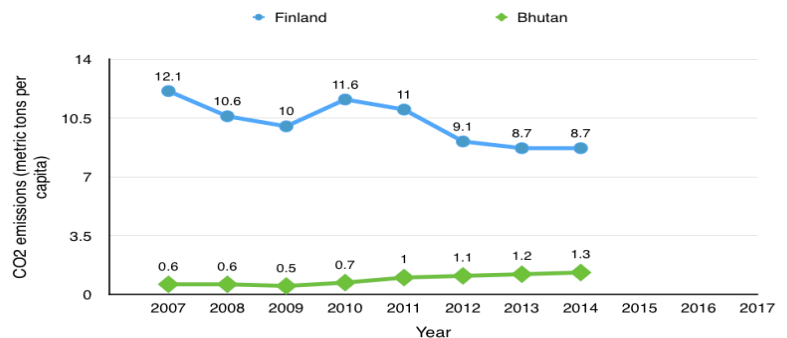


Figure 2. CO2 emissions (metric tons per capita) of Finland and Bhutan Source: World Development Indicators-The World Bank.

4.1.3. Forest area (% of land area)

Land that is under natural or planted trees strands of a minimum of 5 meters is considered forest area, whether they are unproductive or productive. Agricultural production tree strands are excluded as well as trees found in gardens urban parks (World Bank, 2018). From the figure below, both countries maintain a great percentage of forest area. Forests make up approximately 73% of Finland land area, between 2007 and 2016. Bhutan’s forest area covers an average of 71.4% between 2007 and 2016. Bhutan’s constitution mandates that at least 60% of the country remain covered by forests at all times (The Constitution of The Kingdom of Bhutan, 2008). Nonetheless, overstocked forests have some negative effects, for instance when trees are crowded and too close to each other, they compete for water, light, and nutrients which lead to a worse habitat for birds, wildlife, and plant diversity. Additionally, more trees can cause a reduction in water. Since water crisis is developing along with climate change, more water is lost from trees by evapotranspiration; consequently,

trees consume more water compared to other agricultural crops (Namgyel, 2019). Furthermore, wood is considered a renewable resource that causes less carbon footprint. Wood is considered a better option in building and construction compared to steel and concrete as they contribute to the greenhouse gas emissions (Namgyel, 2019). As for Finland, around 13% of the forest area is under restricted use or protected, which is considered the highest share in Europe. The fifth greatest wood resources in Europe is present in Finland and during the past decade the growth of wood resources is greater than the amount of harvested wood, this means that wood resources are growing. Finland aims at preserving healthy forests for future generations by combining a wise combination of protection and utilization (Ministry of Agriculture and Forestry of Finland, n.d.).

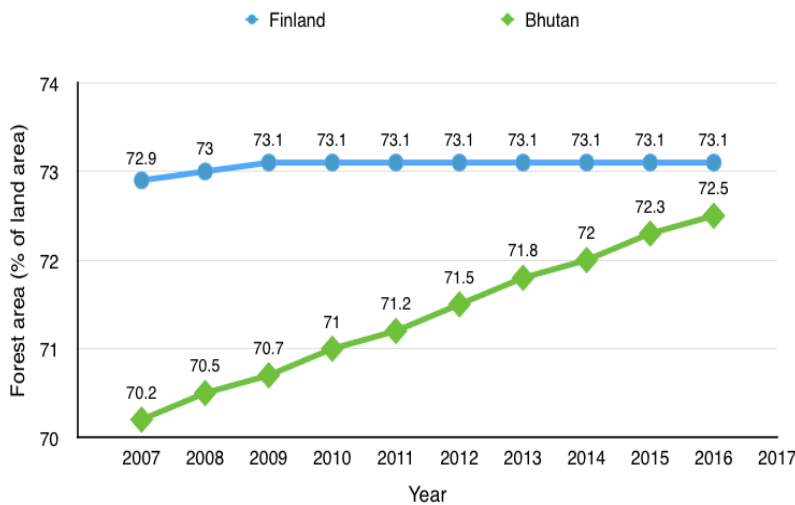


Figure 3: Forest area (% of land area) of Finland and Bhutan. Source: World Development Indicators-The World Bank.

4.1.4. Renewable electricity output (% of total electricity output)

The percentage of electricity generated from renewable power plants in the total generated electricity by all plants (World Bank, 2018). Between 2007 and 2015, 100% of Bhutan’s electricity output was renewable. Finland, on the other hand, produced an average of 35.5% renewable electricity between 2007 and 2015. In Bhutan, the single source of electricity is hydropower, the way in which the river patterns, referred to as white gold, are naturally designed to enable for large amount of energy production which is also clean energy. Hydroelectricity is a major contributor to Bhutan GDP, the country sells part of the clean energy created to its neighbor; India. The hydroelectricity provides electricity to around eighty percent of the population which helped decrease the firewood dependence for energy (Sider, 2011). In order to reduce greenhouse gas emissions, Finland promotes renewable energy sources. The aim is to increase renewable energy use during the 2020s to reach more than 50 percent of end-consumption energy. Nowadays, fuels from forest industry side streams, wood-based fuels, bioenergy, wind power, solar electricity, and hydropower (Ministry of Economic Affairs and Employment of Finland, n.d.).

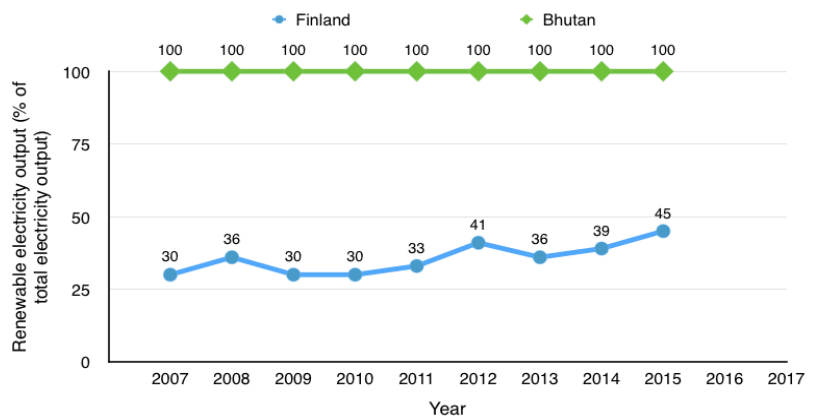


Figure 4: Renewable electricity output (% of total electricity output) in Finland and Bhutan. Source: World Development Indicators-The World Bank.

4.3 Health

This section will examine some health indicators in both Finland and Bhutan.

4.3.1. PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)

According to the World Bank (2019), this indicator measures the percentage of the population living in areas with mean annual concentration of PM2.5 exceeding 10 micrograms per cubic meter, which is the World Health organization recommended guideline. The figure shows that between 2010 and 2016, almost hundred percent of Bhutan’s total population is exposed to PM2.5 air pollution while approximately zero percent of Finland population is exposed to PM2.5 air pollution.

Air pollution is becoming a greater challenge to Bhutan; it is mainly attributed to emission from India and China (Pannozzo, 2011). Additionally, vehicle emissions and firewood increase air pollution which particularly worsens during the winter. However, electric vehicles are promoted along with wood stoves improvements in order to reduce emissions (Dolkar, 2018). As for Finland, air quality has improved significantly in recent years, thanks to air pollution control. Dozens of measuring points are monitored for air quality in plenty of locations throughout the country, and real-time data is produced by industry, and municipalities. However, energy production, traffic, and industry still generate emissions into the air (Environment, 2016).

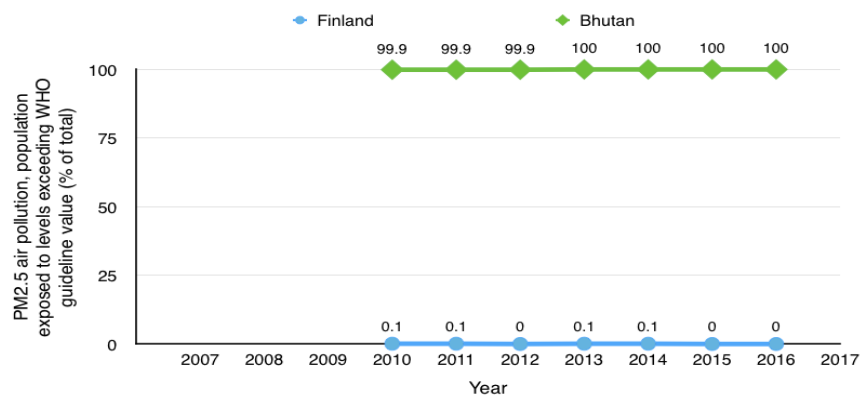


Figure 5: PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total) in Finland and Bhutan. Source: World Development Indicators-The World Bank.

4.3.2. Life expectancy at birth, total (years)

The number of years newborn infants is expected live if the prevailing mortality patterns at the time of birth remain the same throughout the infant’s life (World Bank, 2019). The above figure shows that life expectancy in Finland is greater than life expectancy in Bhutan. Between 2007 and 2016, the average life expectancy in Finland is 80.5 years while the average life expectancy in Bhutan is 68.3 years. However, life expectancy for both countries has been slightly but steadily increasing throughout the years. The high life expectancy in Finland can be attributed to the health care improvements and preventive measures which includes providing free, and healthy school meals for all students, and providing affordable housing so that individuals can afford purchasing good food (Koljonen, 2018). For Bhutan, the health care system has rapidly improved since its planned socio-economic development. It focused reducing premature mortality from non-communicable diseases, tackling epidemics such as malaria, hepatitis, AIDS, tuberculosis, and water-borne diseases (Thinley, Sharma, & Wangmo, 2017).

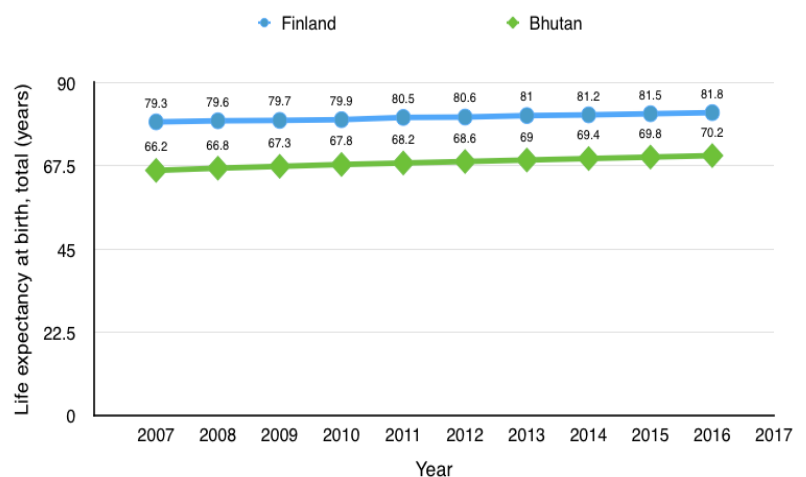
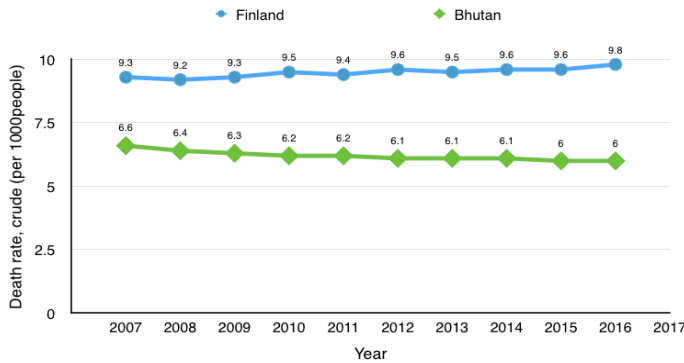


Figure 6: Life expectancy at birth, total (years) in Finland and Bhutan. Source: World Development Indicators-The World Bank.

4.3.3. Death rate, crude (per 1000 people)



Crude death rate measures the number of deaths, per 1000 population, taking place during the year (World Bank, 2019). When observing the figure, the death rate for both countries fluctuates only slightly. For Finland, the death rate has been increasing slightly; in 2007 the death rate was 9.3 per 1000 while in 2016 the death rate reached 9.8 per 1000. For Bhutan, death rate has been declining; in 2007 the death rate was 6.6 per 1000 while in 2016 the death rate decreased to 6 per 1000.

Figure 7: Death rate, crude (per 1000 people) in Finland and Bhutan. Source: World Development Indicators-The World Bank

4.3.4. Cause of death, by non-communicable diseases (% of total)

Cardiovascular diseases, digestive diseases, cancer, skin diseases, congenital abnormalities, musculoskeletal diseases are all considered non-communicable diseases (World Bank, 2019). The above figure shows that non-communicable diseases cause higher percentages of death in Finland compared to Bhutan. According to Institute for Health Metrics and Evaluation (2017), the major causes of death in Bhutan and Finland are heart disease and cancer. Also, Alzheimer’s disease causes a large number of deaths in Finland.

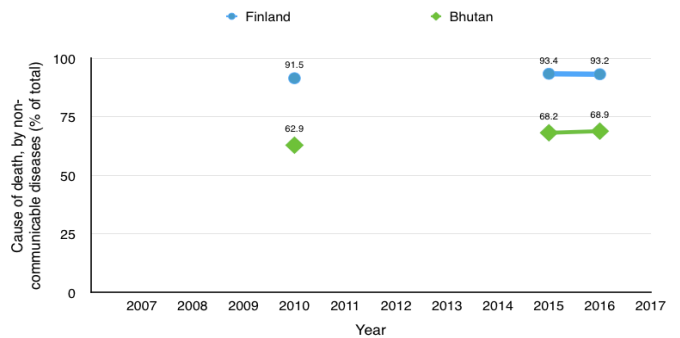


Figure 8: Cause of death, by non-communicable diseases (% of total) in Finland and Bhutan. Source: World Development Indicators-The World Bank

4.3.5. Suicide rates

Nowadays, mental health issues such as anxiety, stress, depression, and bipolar disorder are on the rise, especially, with the increasing globalization and rapid communication which are causing our lives to move at blinding speeds.

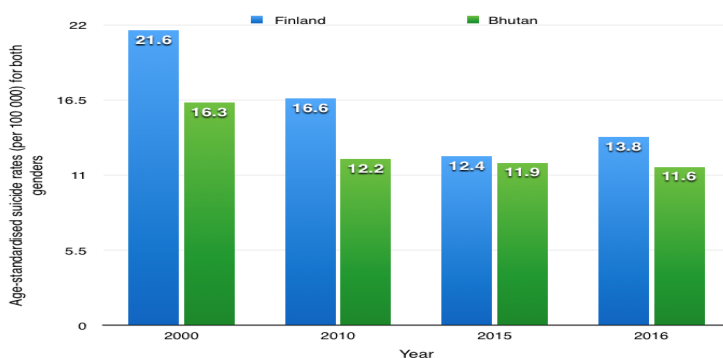


Figure 9. Age-standardized suicide rates (per 100 000) for both genders. Source: World Health Organization.

The figures show that both countries suffer from high suicide rates. However, since Finland population is greater than Bhutan population, the suicide rates in Bhutan are alarming. The increase of untreated mental illness including depression and schizophrenia, and the stigma surrounding mental illness where people do not seek help and attempt to deal with their illness on their own are major factors for the high suicide rates in Bhutan (Lhamo, 2017). Despite being labeled as the happiest country in the world and its per capita income is among the world’s highest, suicide is a major cause of death. The high suicide rates are attributed to depression and mental illness. Additionally, some studies show that during summer months the suicide mortality is higher (Hiltunen et al., 2011).

5. Policies and recommendations

In order to combat climate change and environmental degradation some policies and recommendations are suggested. These include having an international organization which studies new technologies in order to assess whether or not these new technologies are safe and environmentally friendly. In addition to evaluating whether or not these new technologies are actually worth it and essential to humanity, and does it serve a certain human need in a way that nothing else can. Furthermore, developed countries have a moral duty towards developing countries since developed countries are wealthier and in most cases more knowledgeable especially when it comes to environmental problems, So they should not take advantage of less fortunate economies and use their lack of awareness regarding pollution and their desperate need for money as a way to produce goods at a lower cost. For instance, the clothing industry in Bangladesh subject its laborers to extremely poor working conditions not to mention the large amount of pollution which leads to various health problems. So, the United States and European Countries should ban their businessmen from building factories in Bangladesh that would harm the environment and subject the worker to any danger whether health or safety. Simply prohibiting actions they will not accept in their own countries. This is because if Bangladesh becomes highly polluted, this pollution would not just affect Bangladesh, it would affect other countries and the whole environment, at the end of the day we all live in the same planet.

Another vital point is that society nowadays places a tremendous emphasis on STEM majors, which are science, technology, engineering, and math majors; on the other hand, art and humanitarian majors such as psychology, philosophy, sociology, and many others are somewhat neglected. Also, their importance as well as their impact is not widely celebrated as much as technology. This will most likely cause imbalances since we need all these fields together. All these fields are somehow linked and impact each other. Moreover, raising awareness on how maintaining the ecosystem can benefit, reward humanity and can make our life more meaningful. For instance, being outdoors in green areas is known to stimulate creativity and peacefulness. When people start developing a sense of connection to the environment, they are more likely to protect it.

As for the developing countries, they should capitalize on the buildup knowledge that we have today. The amount of knowledge and information that human have developed over the years is countless so governments as well as business should benefit from the experiences of other countries and try to avoid any previous oversights and mistakes. Developing countries should actually take Bhutan as an example on how to develop while at the same time maintaining the environment. Egypt, for example, contains lots of wonderful natural locations, if these locations were preserved, they can attract eco-tourists. However, the government needs to regulate tourism in order to avoid destroying these locations as a result of mass tourism. Additionally, individuals are the major players in solving environmental problems. Sometimes people underestimate their power, but in fact, people have the power to stop harmful business practices. For instance, if people became aware that a certain company is causing large amount of pollution or subjecting its workers to inhuman condition, they can boycott this company which would probably force it to change its practices and processes.

6. Conclusion

To claim that one country is better than the other would be unfair and biased. This is because each country is different and each country is faced with its own challenges. This paper intended to shed some light on the two distinct ideologies of technocentrism and ecocentrism by choosing two countries that seemed closely related to these two schools of thoughts. Bhutan's development is impressive so far and proves that countries do not have to sacrifice the environment in order to achieve economic growth and prosperity and show that the ecocentric approach can be successful. The ecocentric approach seems to be our way out of the environmental threats we are facing such as climate change. However, Bhutan needs to monitor and moderate its consumption levels to avoid resource depletion as in Finland case. Finland, on the other hand, needs to place more emphasis on the environment. Since dealing with technology as the magical solution without an efficient assessment and criticism is immensely dangerous to the environment as well as humanity. And reducing Finland emissions by importing and producing in other countries does not make it environmentally friendly. In fact, we all need to realize that Technology act as pain-killers that merely relieve the symptoms temporarily rather than treat the underlying causes. Accordingly, if we rely heavily on technology, we risk getting stuck in a loop where we develop a technology for one problem but later on discover that the technology itself is causing another problem hence we develop another technology as so on. Thus, we should set boundaries for technology in order to recognize when we are going too far.

REFERENCES

-
- Anukwonke, C. (2015). The Concept of Tragedy of the Commons: Issues and Applications. Retrieved from https://www.researchgate.net/publication/277708953_The_Concept_of_Tragedy_of_the_Commons_Issues_and_Applications/stats
- Central Intelligence Agency (2019). The World Factbook. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/fi.html>
- Clark, D. (2011). Which nations are most responsible for climate change?. The Guardian. Retrieved from <https://www.theguardian.com/environment/2011/apr/21/countries-responsible-climate-change>
- Costanza, R., Hart, M., Talberth, J., & Posner, S. (2009). Beyond GDP: The need for new measures of progress. *The pardee papers*.
- Dolkar, S. (2018). Air Pollution Becoming a Serious Concern in Bhutan. BBS. Retrieved from <http://www.bbs.bt/news/?p=88662>
- Emetumah, F. C. (2017). Modern Perspectives on Environmentalism: Ecocentrism and Technocentrism in the Nigerian Context. *Asian Research Journal of Arts & Social Sciences*, 1-9.
- Environment (2016). Air Pollution in Finland. Retrieved from https://www.ymparisto.fi/en-US/Climate_and_air/Air_pollution_control/Air_pollution_in_Finland
- Frame, B. (2005). Bhutan: a review of its approach to sustainable development. *Development in Practice*, 15(2), 216-221.

- Giddings, B., Hopwood, B., & O'Brien, G. (2002). Environment, economy and society: fitting them together into sustainable development. *Sustainable development*, 10(4), 187-196.
- Hassi, S. (2017). What Finland doesn't want you to know about its forests? Euractiv. Retrieved from <https://www.euractiv.com/section/climate-environment/opinion/what-finland-doesnt-want-you-to-know-about-its-forests/>
- Heller, T. & Kaminstein, D. (n.d.). The Loss of The Natural Environment: A Group Relations Perspective on Our Failure to Take Collective Action. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.89.1709&rep=rep1&type=pdf>
- Hiltunen, L., Suominen, K., Lönnqvist, J., & Partonen, T. (2011). Relationship between daylength and suicide in Finland. *Journal of circadian rhythms*, 9(1), 10.
- Hodgson, H. (2017). Global health watch 5: an alternative world health report. *Medicine, Conflict and Survival*, 33:4, 323-325, DOI: 10.1080/13623699.2017.1411560
- Institute for Health Metrics and Evaluation (2017). Bhutan. Retrieved from <http://www.healthdata.org/bhutan>
- Institute for Health Metrics and Evaluation (2017). Finland. Retrieved from <http://www.healthdata.org/finland>
- Jeffrey, R. (2013). Bhutan's Environmental Success is a Pleasing Paradox. The Conversation. Retrieved from <https://theconversation.com/bhutans-environmental-success-is-a-pleasing-paradox-21338>
- Koljonen, A. (2018). Life expectancy is rising in Finland – unlike in the UK. What's going right? The Guardian. Retrieved from <https://www.theguardian.com/commentisfree/2018/oct/17/life-expectancy-rising-finland-uk-scandinavia>
- Lhaden, T. (2018). An Update on Bhutan's Economy. World Bank. Retrieved from <http://blogs.worldbank.org/endpovertyinsouthasia/update-bhutan-s-economy>
- Lhamo, P. (2017). Health Experts Look at Suicide and Causes. Kuensel. Retrieved from <http://www.kuenselonline.com/health-experts-look-at-suicide-and-causes/>
- Lindgren, M. (2003). Finnish forestry: Destroying forests, destroying livelihoods. *Forest*. Retrieved from <http://www.greenpeace.nl/Global/nederland/report/2007/8/finnish-forestry-destroying-f.pdf>
- Lyytimäki, J. & Lähteenoja, S. (2016). Finland Aims to Become a Sustainable Development Leader. Government Plan for Analysis, Assessment and Research. Retrieved from https://www.demoshelsinki.fi/wp-content/uploads/2016/08/PolicyBrief_en_Finland_aims_to_become_a_sustainable_development_leader.pdf
- Ministry of Agriculture and Forestry of Finland (n.d.). Forest resources in Finland. Retrieved from <https://mmm.fi/en/forests/forestry/forest-resources>
- Ministry of Economic Affairs and Employment of Finland (n.d.). Renewable energy in Finland. Retrieved from <https://tem.fi/en/renewable-energy>
- Ministry of the Environment (2014). Environmental Impacts of the Financial Crisis Evident. Retrieved from [https://www.ym.fi/en-US/Nature/Environmental_impacts_of_the_financial_c\(28166\)](https://www.ym.fi/en-US/Nature/Environmental_impacts_of_the_financial_c(28166))
- Ministry for Foreign Affairs of Finland (n.d.). Agenda 2030 – Sustainable Development Goals. Retrieved from <https://um.fi/agenda-2030-sustainable-development-goals>
- Namgyel, P. (2019). Saving Bhutan's Forest. Kuensel. Retrieved from <http://www.kuenselonline.com/saving-bhutans-forest/>
- Panno, L. (2011). 'Brown cloud' penetrates Bhutan. Bhutan Observer. Retrieved from <https://web.archive.org/web/20111011164221/http://www.bhutanobserver.bt/'brown-cloud'-penetrates-Bhutan/>
- Sider, S. (2011). Bhutan's Moving Gold: How water is powering the country. CNN. Retrieved from <https://edition.cnn.com/2011/11/07/world/asia/bhutan-green-energy/index.html>
- The Constitution of the Kingdom of Bhutan (2008). Retrieved from <https://www.nationalcouncil.bt/assets/uploads/files/Constitution%20of%20Bhutan%20English.pdf>
- The Guardian (2009). Carbon emissions per person, by country. Retrieved from <https://www.theguardian.com/environment/datablog/2009/sep/02/carbon-emissions-per-person-capita>
- Thinley, S., Sharma, J. & Wangmo, K. (2017). Sustainability of Bhutan's Health Services. The Druk Journal. Retrieved from <http://drukjournal.bt/sustainability-of-bhutans-health-services/>
- Tutton, M. & Scott, K. (2018). What tiny Bhutan can teach the world about being carbon negative? CNN. Retrieved from <https://edition.cnn.com/2018/10/11/asia/bhutan-carbon-negative/index.html>
- World Health Organization (2018). Suicide rate estimates, age-standardised Estimates by country. Retrieved from <http://apps.who.int/gho/data/node.main.MHSUICIDEASDR?lang=en>
- World Development Indicators-The World Bank (2019). Retrieved from <https://databank.worldbank.org/data/reports.aspx?source=2&series=AG.LND.IRIG.AG.ZS&country=>
- Yangka, D., Newman, P., Rauland, V., & Devereux, P. (2018). Sustainability in an emerging nation: The Bhutan case study. *Sustainability*, 10(5), 1622.