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Global health and environmental sustainability

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Abstract

The evolving trend at which the wellbeing of the human population at the world level is being studied, researched and practiced seems to be of double edged sword. Since one way to score global health and environmental sustainability is through measuring the prevalence of various global diseases in the world and their threat to decrease life expectancy in the present day as well as availability of natural resources. There is there fore need to re-evaluate the current trends, as well as proffer lasting solutions. To make a land mark success on present needs without compromising on future generation needs, there should be evolutionary and swift transformation in health for all programs, imbibing green choice life / eco-friendly production and consumption, urban farming. Thus, global health and environmental sustainability should be summed up as the study and application of attaining welfare equity for all people in a sustainable environment.

Keywords: Global health; Sustainability; Environment; Re-emerging; Emerging disease; zoonotic; Global warming; Green choice; Urbanization; Economic; Social; Policies and ecosystem

1. Introduction

What improvements in global health and a sustainable environment have resulted from the current advancements in scientific research and publications, surveillance, diagnostics, wearable technology, mobile applications, high-speed internet connectivity, urbanization, and high-throughput technologies? The answers to these and other issues will determine the global health trends of today and how they affect our surroundings. There is no definitive list of global health challenges because the field is dynamic and always evolving [Glouberman and Millar, 2003] [1]. A problem that exists in one location one year might not exist there the next year, or it might be considerably more significant and pervasive. Among them are the ongoing worldwide health issues, such as the 2023 monkey pox outbreak, and offering fresh risks or perils. However, some global health problems, including air pollution, cancer, and tuberculosis, are so persistent and constant that they appear to be there forever [Ojiako et, al., 2023] [2].

By definition, global health is the practice of placing a population's overall well-being in an international perspective as a top priority. However, there are unique global health concerns for every regional population. Population-based preventive and individual-level clinical treatment is combined in the field of global health, which stresses transnational health challenges, determinants, and solutions. It also encompasses numerous disciplines both inside and outside the health sciences and fosters multidisciplinary collaboration.

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The Global Health History: The terms tropical medicine and international health gave rise to the phrase global health. "Colonial medicine" throughout the 19th and early 20th centuries concentrated on maintaining the health of European colonial rulers and shielding them from the health effects of tropical diseases (caused by infections carried by native-born individuals). The term "tropical medicine" was therefore created.

The second half of the 20th century saw the evolution of international health, which is now centered on issues and concerns related to health in low-income nations. The main goals of international health are to boost mother and child health; enhance water supply and cleanliness; as well as to prevent, measure, and treat infectious diseases [Glouberman and Millar, 2003] [1].

In the past 20 years, the term "global health" has gained traction. This idea grows and becomes more comprehensive beyond national boundaries to encompass all health issues and global factors [Holst, 2020] [3].

Additionally, global health encompasses addressing non-health sectoral challenges, social and political determinants, and drivers of health [Ojiako et al., 2023] [2].

Conversely, environmental sustainability refers to the preservation of an ecosystem's natural composition for future usage by prudent use and effective management. Put another way, environmental sustainability is the act of minimizing excessive carbon emissions while also putting checks and balances on the use of natural resources. It would be easy to sum up global health and environmental sustainability as the study and application of attaining welfare equity for all people in a sustainable environment.

The main Aim of this review is to discuss the Global Health and Environmental Sustainability.

The main Objectives of this health review are as follows:

- To identify the determinants of global health and environmental sustainability
- To examine the current trend of global health.
- To examine challenges of global health
- To discuss concepts of environmental sustainability.
- To identify the linkage of public health and environmental sustainability
- To state the global commitments in addressing international health issues and environment
- To state current ways of achieving global health and sustainable environment.

2. Unit 2: determinants of global health and environmental sustainability

The general determinants of global health and environment include:

- Social environment, [Zill and Brim, 1983] [4].
- Physical environment, [Corvalan 2011] [5].
- Genetic endowment, [Baird 1994] [6].
- Individual response (behavior and biology),
- Health care, [Bunker et. al., 1995] [7].
- Disease, [Berkman and Syme, 1979] [8].
- Health and function
- Wellbeing, Wellbeing, [DfID, 2006] [9].
- Prosperity, [Dorling et al., 2007] [10].

3. Unit 3: current trends in global health

3.1. Epidemiology and Public Health Challenges

While overall improvements in health indices have occurred, the distribution of these gains has not been equitable. There are severe exceptions to the global decline in population density and numbers; for instance, the HIV/AIDS pandemic has contributed to the reversal of previous advances in Zimbabwe, where the current life expectancy at birth is only 40.9 years. Despite these global trends, there is rapid growth in certain areas of Asia.

The globe was made aware of the deficient global notification systems by the SARS outbreak in 2003 and the COVID-19 pandemic in 2019. Both viruses started in a remote area of China, moved quickly to Hong Kong, and within a week had infected 8,000 people globally. Analysts discovered that a number of omissions in the outbreak's reporting had allowed it to take hold of anything. The illness reporting system established by the International Health Regulations (IHR) in 1969 was centered on the three principal infectious diseases that were prevalent at the time: yellow fever, cholera, and plague. The SARS pandemic brought to light the necessity for a formal, innovative, and more pertinent network for international warning and communication [Smith et al., 2009], [Smith et al., 1999] [11], [12].

3.2. Increasing Population Densities

These have resulted in more interactions between people and animals, which has aided in the development and spread of zoonotic illnesses.

In addition, infectious diseases are greatly affected by exponential rise in travel. Every year, more than 4.5 billion flights are taken, and each one has the potential to spread illness.

3.3. The Dramatic Changes In Global Food Prices

In February 2024, the price of rice has hit an all-time high of \$75,000 per bag. The impact is greatest in places least equipped to handle the issue. There will likely be a corresponding increase in child undernutrition in sub-Saharan Africa. While hunger is improbable, South-East Asian countries would experience considerable economic hardship as a

result of decreased rice exportation. Mortality increases as GDP declines, and the long-term effects on this region should not be undervalued.

3.4. The World Health Assembly Resolution 2005

In order to "avoid unnecessary interface with international traffic and trade and to prevent, protect against, control, and provide a public health response to the international spread of disease," the resolution stipulated that actions must be taken "in ways that are commensurate with and restricted to public health risks." The new rules upheld every nation's obligation to take part in international monitoring. According to [DfID 2006] [9], national IHR focal points are now required to report any potential international public health emergency, reply to requests for report verification within 24 hours, and reveal any suspected concerns in other areas.

3.5. Establishment of Rapid Diagnostics and Specialist Laboratories

With the goal of using a network of efficient diagnostic laboratories to detect epidemic threats as soon as feasible, WHO has recently created an Integrated Capacity Development for Laboratory Specialists. In order to accomplish a long-term improvement in laboratory infrastructure, a training program based on world regions seeks to assist places with a weak laboratory network [WHO, 1999] [13].

In spite of these recent initiatives, the details of the current pandemic plans are still a little vague. Although emerging epidemics necessitate more complex information collecting due to greater mobility, medicine often underutilizes potentially strong statistical methods. It is anticipated that employing mobile phones to monitor population movements will provide precise forecasts regarding the course of epidemics, as well as details on when and how well important interventions, such border closures, will work. The influenza A virus is currently the biggest infectious hazard. In contrast to SARS, infection frequently goes unnoticed, making early detection difficult and viral shedding happens too early in the lifecycle for effective quarantine.

4. Unit 4: challenges impeding global health

4.1. Non-communicable Diseases (NCDs)

These include risk factors like alcohol and tobacco use, obesity and unhealthy eating, physical inactivity, and chronic respiratory, cardiovascular, and diabetic disorders. Almost three out of every four deaths worldwide are caused by these global health problems. Yet even the worldwide health risks associated with NCDs differ geographically and economically. According to Danes et al. [2011][14], low- and middle-income countries account for 77% of NCD-related mortality.

4.2. Communicable Diseases

According to Gandhi et al. [2006] [15], infectious diseases include HIV/AIDS, influenza, malaria, neglected tropical diseases (NTDs), tuberculosis, viral hepatitis, and, of course, COVID-19, Ebola, and other viruses. Although many of these illnesses are equally widespread, they rank highly among the main causes of death and disability in developing nations and among marginalized groups of people [Sanjiv and Preetha, 2012] [16].

4.3. Food Security and Nutrition

Notwithstanding notable advancements in food security in recent decades, hunger and famine continue to be major worldwide health issues. Natural disasters can reveal political and economic disparities even in wealthy nations, and environmental change and population increase put a pressure on infrastructure [Sanjiv and Preetha, 2012] [16]. The majority of human calories come from a small number of animal and plant species, and these food sources are under constant attack [DfID, 2006] [9]. According to Pekka et al. [2002] [17], diseases that affect cattle, invading pests, genetic variety loss, and climate change are some of the threats to food sources.

4.4. Environmental Health

There are many ways in which the environment affects global health. The theory posits that the virus responsible for COVID-19 originated in a wild animal and spread to humans due to human encroachment into formerly uninhabited areas. HIV and Ebola also become zoonotic diseases. New infectious diseases may appear if people continue to travel into places that were once wild and come into touch with animals that were previously isolated [Gandhi, et al., 2006] [15]. Therefore, preventing development in the wilderness can also prevent harm to people [Smith et al., 2009], [Smith et al., 1999] [11], [12].

4.5. Environmental pollution

Human health is negatively impacted by environmental pollution, which can cross national borders when released by one nation. Each year, millions of premature deaths and illnesses are brought on by dirty air. Animals and humans are both poisoned by contaminated water [Sanjiv and Preetha, 2012] [16].

4.6. Health Inequity

Both biological determinants and the environments in which people are born, grow, and live have an impact on health and health equity. Health disparities can be made worse by institutional procedures, social norms, and political, legal, and economic factors [Sanjiv and Preetha, 2012] [16]. Advanced healthcare systems that are accessible to all patients and reasonably priced exist in certain nations. Millions more people struggle to get access to healthcare in other regions of the world, particularly in less developed nations [WHO, 2008] [18]. Millions of fatalities occur each year as a result of lack of access to healthcare, whether due to financial constraints or other factors.

4.7. Mental Health

Previously disregarded, mental health is now receiving the attention it so well deserves as a worldwide health concern. According to Sanjiv and Preetha [2012] [16], depression is a major contributor to disability and suicide is a major cause of death for those between the ages of 15 and 29. Individuals who suffer from serious mental health disorders frequently encounter stigma, discrimination, and infringement of their human rights. They can even pass away up to 20 years earlier than the average lifespan of their community. Less severe mental health issues might impact one's capacity to engage in community activities, maintain connections with family and friends, and perform well at job or school. The majority of individuals worldwide only have restricted access to excellent mental health care services.

5. Unit 5: Overview of environmental sustainability

5.1. History of Environmental Sustainability

With the passage of the National Environmental Policy Act (NEPA) in 1969, the US took a major step toward environmental sustainability. The United States established a national policy, known as NEPA, "to create and maintain conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations," according to the United States Environmental Protection Agency [EPA, 2013] [19].

As nations all over the world deal with escalating climate change challenges, public interest in environmental sustainability has continued to rise in the decades after the NEPA was passed. At the 2015 Conference of the Parties, an

international climate meeting, 196 parties ratified the Paris Agreement. As per the United Nations, Nearly all countries in the world ratified the legally binding Paris Agreement as part of their efforts to combat climate change. With an aim to keep the increase below 1.5 degrees Celsius, the pact aims to cut carbon emissions sufficiently to limit the rise in global temperature to no more than 2 degrees Celsius above pre-industrial levels.

5.2. Concepts of environmental sustainability

5.2.1. Rules Regarding the Environment

Environmental sustainability standards differ significantly depending on the economic, social, and environmental circumstances of a given area. Federal regulations are frequently established.

According to the Environmental Protection Agency [2013] [19], everything is regulated, including hazardous waste management and refrigerants and air pollutants. The EPA establishes guidelines for the quality of the air, water, soil, wildlife habitats, and carbon emissions. Financial fines and legal action are used to enforce the guidelines. Local, state, and federal governments may also establish stricter regulations.

5.2.2. Sustainability of the Environment and Economic Growth

It is obvious that businesses have a duty to society to adopt environmentally friendly practices, but these actions don't have to conflict with corporate objectives. According to Marmot et al. [1987] [20], environmental sustainability should actually balance profits with the needs of people and the environment.

5.2.3. ESG in addition to Sustainability of the Environment

Sustainability and "ESG" (environmental, social, and governance) are often used synonymously, particularly in benchmarking and data disclosure contexts.

While ESG has emerged as the favored word for investors and the capital markets, sustainability is an umbrella term that encompasses numerous green themes and corporate responsibility. Although sustainability initiatives were the industry's first focus, ESG processes, performance, reporting, and relevance to capital opportunities have all since developed. Finding risk-adjusted returns is aided by ESG data. The shift in how businesses measure and disclose their performance has been made possible by the emphasis placed on all three pillars.

6. Unit 6: linkage of public health and environmental sustainability

As defined by WCED [1987] [21], sustainability is development that satisfies current demands without jeopardizing the capacity of future generations to satiate their own needs. Thus, the three pillars of environmental sustainability environmental, social, and economic developments—must be properly linked for global health to succeed [UN, 2002] [22].

1. **Climate Change and Health:** The state of human health is determined by a complex interplay between socioeconomic growth and the forces driving climatic change. The relationships between economic, social, and environmental forces and climate change are outlined in the 2007 International Panel on Climate Change (IPCC) report [IPCC, 2007] [23]. Human health gradually declines as a result of the dynamics surrounding socioeconomic development and the drivers of climate change, which either strengthen or threaten the vulnerabilities. Figure 1 depicts socioeconomic development, which encompasses trade, technology, patterns of production and consumption, and socio-cultural preferences (as well as the energy from fossil fuels needed to support these practices). When combined, these change the need for resources and energy, which raises the possibility of greenhouse gas and aerosol emissions [Corvalán, 2011] [5]. Consequently, raise the amounts of greenhouse The growth of extreme weather events, variations in precipitation and temperature, and a rise in sea level are all consequences of climate change, which is fueled by gases in the atmosphere. The impact of climate change on ecosystems, water resources, heat waves, air pollution, and food security on human health is a serious concern [Bruce et al., 2000], [WHO, 1994], [WHO, 2011] [24],[25], [26].

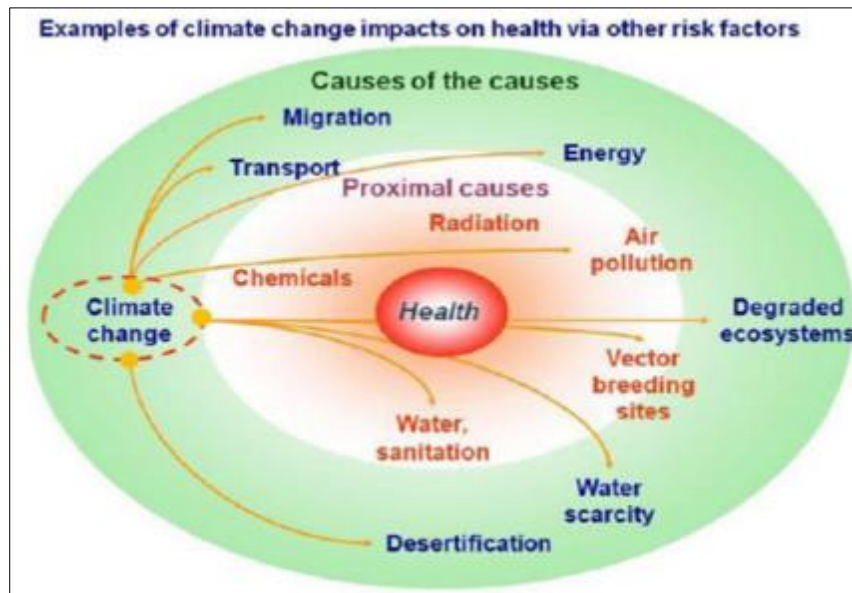


Figure 1 Impact of Climate Change on Health [Corvalan, 2011] [5].

- **Physical Environment:** During the 1840s to 1870s, the public health movement placed great emphasis on improving the environment as a means of lowering the epidemic rates of infectious diseases. These diseases thrived in industrial cities' overcrowded housing and subpar sanitation.
- **Social Environment and Prosperity:** The determinants of social environmental sustainability that have been connected to global health include the educational system, family structure, social networks, social class, work environment, and level of wealth [Marmot et al., 1987] [20].

Children's physical and mental health, for instance, is impacted by the state of family structure [Entwisle, 1995] [27]. On average, children in single-parent households do not do as well on measures of development, performance, and mental health as children in two-parent families [Schor and Menaghan, 1995] [28].

Education has an effect on health status distinct from its affect on money. Early education may have a significant impact on one's health. Moreover, a major factor influencing the welfare and survival of children is the educational attainment of the mother [Zill and Brim, 1983], [Entwisle, 1995] [4], [27].

2. **Economic prosperity:** Improved health is also correlated with economic wealth. The average age of death for the poor has historically been lower than that of the rich. According to worldwide comparisons conducted by the Organization for Economic Cooperation and Development, median income has less of an association with overall death rates than the income gap between the top and lowest deciles of income [Wilkinson, 1992], [Wilkinson, 1994] [29], [30].

7. Unit 7: Global commitment in addressing international health issues and environment

- **United Nations Foundation** set up in San Francisco California United States in the year 1945 with the aim of assisting the United Nations (UN) and its humanitarian efforts through advocacy, partnerships, community building and fund-raising.
- **World Wild life Foundation (WWF)** founded in Swiss in 1961 Aimed at helping local communities conserve the natural resources they depend upon. They also help to transform markets and policies toward sustainability. They as well protect and restore species and their habitats [Crisp, 2007] [31].
- **Clinton Global Health / Clinton Health Access Initiatives (CHAI)** founded in New York, in the year 2002: It is a global organization, committed to saving lives and improving health outcomes in low and middle income countries by enabling government and private sectors to strengthen and sustain quality health system.
- **Bills and Melinda Gates Foundation** based I Seattle, Washington founded in the year 2000. Aimed at helping all people lead healthy and productive lives. In developing countries, it focuses on improving people's health and giving them the chance to lift themselves out of hunger and extreme poverty.

- **Green Choice Life** was set up in the year 2000 in Castle cliff, Wanganui-Manawa New Zealand. It is aimed at making our environment a clean, green and better place to live, promote cycling, awareness program, adopt a tree and anti-pollution drive [Markandya et al., 2009] [32].

8. Unit 8: Attaining international health and sustainable environment

8.1. Attaining global health through green choice life

Selecting the consumer category we want to belong to is the main focus of the green choice life. Integrating the effects of what we make, purchase, use, or consume with the environment is what it means to be a green consumer [Anastas et al., 2000] [33]. Recognizing critically that the emission of various pollutants and inappropriate use of natural resources both negatively impact world health [Syme, 1996] [34]. The adoption of eco-friendly food packaging, that utilizes recyclable, renewable, and recycled materials aids production industries in reducing CO₂ emissions [Figure 2]. Additionally, the 7Rs—Rethink, Refuse, Reduce, Reuse, Repair, Regift, and Recycle—aim to preserve the ecosystem by minimizing the amount of material taken from the planet [Anastas et al., 2000] [33].

- **RETHINK:** Take a step back and consider the kind of customer you want to be and the impact this will have on the environment.
- **REFUSE:** Consider your options carefully and be ready to buy nothing at all. Green buyers start the buy-and-use cycle at the beginning. Purchase goods that cause the least amount of environmental damage and buy fewer of them.
- **A. REDUCE YOUR CONSUMPTION:** Purchase fewer goods choose long-lasting, minimally or non-packaged items, borrow rather than buy, and compost. No longer used or needed items are sold or donated. Use cloth napkins, make two-sided copies, unsubscribe from junk-mail lists, and bring reusable shopping bags to the store to cut down on the amount of paper you use. Many facets of city life can be improved by urban farming and local food production, which can lessen the environmental impact of food transportation.
- **B. REDUCE WHAT YOU TAKE FROM THE EARTH:** Cut back on the air conditioning and heating. Ascertain that your house is adequately insulated and make use of Energy Star appliances. Instead of driving, take public transportation, walk, bike, or carpool. Practice "eco-driving," which entails maintaining a constant speed, taking action rather than just reacting, and making sure your tires are adequately inflated, if you must drive. When not in use, turn off computers and lights. Compact fluorescents save energy and can be used in place of normal bulbs.
- **C. Reduce** the use of toxic substances:
 - Buy food and clothes that has been certified organic to support sustainable agriculture.
 - Purchase secondhand clothing and donate it when you outgrow it.
 - Produce or buy dish soap, laundry detergent, and natural, non-toxic cleaning products [EPA, 2013] [19].
 - Use natural, safe pest control methods in your yard or garden [Anastas and Werner, 1998] [35].
 - Only employ "green" dry cleaners.

Select non-toxic, low-VOC, formaldehyde-free, environmentally friendly toys, furniture, paints, carpets, and restoration supplies [Anastas et al., 2000] [33].

- **REUSE:** Up cycle instead of trash away. Examples: glass jars can be used to store dry goods, old calendar pages are used as DIY envelopes, used toothbrushes are used to clean hard to reach spots, empty toothpaste tubes are used as funnels. Drink from a reusable coffee cup or water bottle.
- **REPAIR:** Make an effort to fix things before throwing them away. The term "throwaway society" has been applied to our modern culture since more things than necessary wind up in landfills. This damages the ecosystem and requires more resources from the planet to produce new goods. Engaging in the "Repair Movement" and making repairs can help preserve the earth's resources.
- **REGIFT:** Regifting is the act of giving someone a gift that you yourself acquired from another person. Refrain from feeling bad! It's a wonderful idea to give it to someone who will appreciate it more than you. All you have to do is adhere to this protocol: You're positive the recipient would like the present. Present comes in its original box and is brand new. It is not a family heirloom or a handcrafted present.
- **RECYCLE (COMPOSTE):** Return items to the trash stream so they can be recycled or used for another purpose. Plastics are melted down to create new items, glass is utilized for roads by crushing and blending with bitumen in conventional asphalt manufacture, and our composted organic waste is used as fertilizer for our gardens. Reduce the amount of metals that are mined by recycling (cans, fluorescents, and electronics), adopting lead-free fishing weights, and thermometers without mercury, rechargeable batteries, and environmentally friendly building materials.

8.2. Attaining global health by protecting our environment

- Buy certified, sustainably harvested forest products; use paper, tissues, towels, and toilet paper with 100% post-consumer recycled content;
- Eat an organic, plant-based diet that places you lower on the food chain; and cut back on or avoid factory-farmed and endangered fish and seafood.
- Conserve and protect precious water by installing low-flow toilets, showers, and faucets; preserve native landscaping; install green roofs; and plant gardens. iv. Compost yard waste and food scraps [Friel, et al., 2009] [36].
- Attaining global health and sustainable environment: through meeting fundamental human needs.
- Convert at least one of your bank, retirement, or investment accounts to a co-op, community bank, or socially conscious fund.
- Purchase organic, certified fair trade goods (like coffee), which support the provision of a living wage, secure working conditions, and a hygienic workplace for laborers.
- Give your time to support the underprivileged in your neighborhood or environmental conservation (volunteering at an environmental organization).
- No matter where you are or how you're feeling, resolve to always wear a smile and treat everyone with respect.
- Recycle kitchen scraps and yard waste [Friel, et al., 2009] [36].

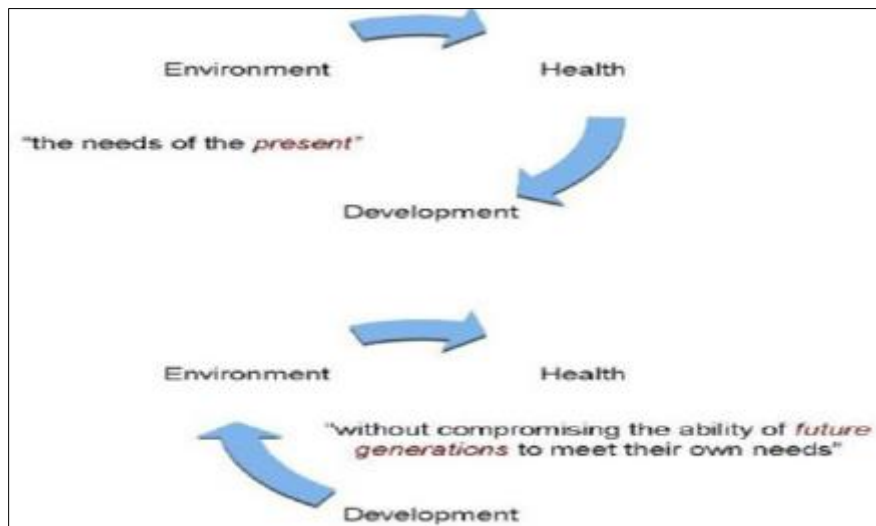


Figure 2 Attaining Present Need, without Compromising Future Generation Needs as well [Corvalan, 2011] [5]

9. Conclusion

The two main international resolutions on global health and environmental sustainability are used to measure how long it will be possible to meet human needs, such as those related to social environment, physical environment, genetic endowment, individual response (behavior and biology), health care, disease, health and function, wellbeing, and prosperity, without compromising needs for the future. Numerous nonprofit organizations were established in an attempt to assist vulnerable nations and communities with regard to health needs, educational opportunities, ecological management, social welfare, and economic well-being. These organizations include Green Choice Life, the World Wild Life Foundation, the Clinton Health Access Initiatives, the United Nations, and the Bill and Melinda Gates Foundation. Notwithstanding these international obligations, there appear to be some restrictions, such as insufficient use of the massive amount of surveillance data gathered, sluggish reporting in infections with no symptoms and illiteracy in rural areas. On the other hand, in an attempt to keep up with civilization, urbanization and industrialization appear to be causing greater stresses on and losses from natural resources. The development of genomics and medicine has also brought up ethical questions about data privacy, the segregation of people with hereditary diseases, and the emergence and reemergence of diseases. Given the close relationship between environmental sustainability and global health, it is vital to educate multinational organizations about the need of adopting a green lifestyle in order to preserve the environment and improve living standards for all. Although it may seem difficult, choosing what matters to us might boost our chances of success because we will be more motivated to maintain our unique routines by these small acts. These might significantly aid in achieving worldwide success in terms of environmental sustainability and health.

Compliance with ethical standards

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The authors declare no competing interest.

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