

Analytical study into the interrelation between environmental attitudes, coronavirus and climate change

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Abstract

The current pandemic of COVID-19 triggered a rethinking of the basics of the environmental interrelatedness between development, climate change and invasive diseases. Given the fact that human-nature relationship determines both human health and environmental quality, this analytical study showed that both invasive diseases such as the recent pandemic of COVID-19 and climate change have a common root, which has resulted from an overall environmental deterioration. This deterioration has been caused by a universal human approach of development, which aims to keep economies growing at the cost of environmental sustainability. The major consequences of this approach are both a disruptive ecological cycles and a depleted natural ability of the environment to balance itself. Therefore, there is more than ever an urgent need to mobilize governments to act on climate change, take mitigation measures to alleviate global warming and combat the loss of biodiversity by adopting the sustainable development approach.

Keywords: Development approach, Invasive diseases, climate change, biodiversity loss, COVID 19.

Introduction

Environment is defined as everything that affects an organism during its lifetime where natural environment encompasses of all living and non-living things occurring naturally including the interaction of all living species, climate, weather and natural resources which affect the human living and economy (Ambrose, et.al., 1997).

Nature is the unseen dimension of water-energy-food nexus that affects all life aspects of human beings. It provides us with ecosystem services that affect the security of food, water and energy. The Millennium Ecosystem Assessment stated that: "any progress achieved in addressing the MDGs of poverty and hunger eradication, human health, and environmental protection is unlikely to be sustained if most of the ecosystem services on which humanity relies continue to be degraded." (Millennium Ecosystem Assessment Report, 2005)

The human-nature relationship determines both the human health and the environmental quality. The Human attitude towards the environment is driven by three main philosophical approaches of environmental ethics including anthropocentric, biocentric and ecocentric which are translated to three different approaches including development, conservation and preservation. (Enger, E. D. & Bradley F. S, 2019).

The current outbreak of coronavirus triggered rethinking the environmental basics and the interrelatedness between philosophical approaches of environmental ethics, environmental attitudes, climate change, biodiversity and ecosystem.

In this paper we will analyze these basics of environmental interrelatedness to bring further understanding to the linkage between climate change and the outbreak of COVID-19. The analysis will include the following:

- Interrelation between philosophical approach of environmental ethics and environmental attitude.
- Interrelation between environmental attitude and climate change
- Interrelation between environmental attitude and invasive species
- Interrelation between climate change and invasive species
- Conclusions and recommendations

Interrelation between philosophical approach of environmental ethics and environmental attitude.

Environmental ethics is the philosophical discipline that considers the moral and ethical relationship of human beings to the environment. In other words: what, if any, moral obligation does man have to the preservation and care of the non-human world?

Philosophical approach of environmental ethics is classified in three approaches: (1) anthropocentrism which is human-centered approach that holds that all environmental responsibility is derived from human interest. It dictates that nature and ecosystem services, such as forests, species, rivers and wetlands are available for our use in order to nourish our development as a species. (2) biocentrism which is life-centered that holds that all forms have an inherent right to exist. It is concerned with more than just clean water and air for humans; it defends the value of biodiversity, endangered species, the preservation of old growth forests, and other components of healthy ecosystems which biocentrism dictates should be protected from human development and (3) ecocentrism approach which maintains that the environment deserves direct moral consideration, not consideration derived from human or animal interests. It takes the concept of biocentrism beyond living organisms and assigns value to those principles and structures which characterize our world as a beautiful, thriving system.

These three philosophical approaches of environmental ethics are translated into three attitudes, development, preservation and conservation.

The development attitude is the most anthropocentric which assumes that human race is and should be the master of nature, it assumes that earth and its resources exist solely for the benefit and pleasure of human beings, it is enforced by the capitalist work ethics and it appreciated highly human creativity and promotes continual economic growth.

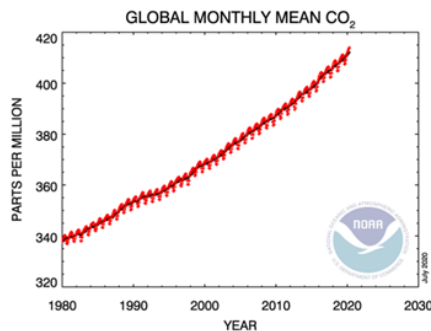
The preservation attitude is the most ecocentric which holds that nature has intrinsic value apart from human uses. It views nature as a refuge from economic activity and not as a resource for it. It promotes keeping large parts of nature intact for aesthetic or recreational reasons.

The conservation attitude seeks a balance between unrestrained development and preservation attitude. It promotes human well-being but considers a wider range of long-term human goods in its decision about

environmental management. It is well aligned with the ideas of sustainable development.

Interrelation between environmental attitude and climate change

The intensity of human activity and the focus on unhindered development (anthropocentric approach) has caused enormous damage to the environment in terms of climate change and loss of biodiversity. The global concentration trend of CO₂ in the atmosphere has been increasing over the last decades and concentrations are estimated to be above 400 parts per million (ppm) (National Geographic 2019). Figure 1 shows the measured global monthly mean values of carbon dioxide, reported by the Global Monitoring Division of NOAA/Earth System Research Laboratory at a globally distributed network of air sampling sites (<https://www.esrl.noaa.gov/gmd/ccgg/trends/global.html#global>).



Increased carbon dioxide emissions has led to an unprecedented degree of climate change. Changes in the chemistry of oceans have been reported in terms of being 30% more acidic compared to preindustrial levels (El-Ashry, 2014). These levels are expected to increase to 150% more acidic by the end of the century. The impact of rising carbon dioxide emissions and climate change on oceans has been reported in more details in terms of "rising sea levels, intensification of storms, continued melting of the Arctic Sea and permafrost, and the continued deterioration of coral reefs" (Ricketts, P. J., 2018). These combined effects will eventually lead to the displacement of millions of people and the vulnerability of many small island states.

Further reports indicate that due to rising emissions of CO₂, we have reached a climate tipping point which we cannot overcome even if we have tried to reduce these emissions (Timothy et.al 2019). Other human activities that adversely impact the planet and undermine biodiversity include mining, logging, intensive agriculture based on burning vast forest land and major residential development (SELBY, D. and KAGAWA, F., 2020). All these activities lead to animals leaving their natural habitat and becoming more crowded in new territories that are too close to humans 'communities, creating channels for transmission of new pathogens and also serving as a source for spillover of infections from animals to people. One clear example is the case of red foxes that attack houses in urban areas in London and other cities in Europe after alteration in significant habitat structure (Bronwyn, 2017).

Interrelation between environmental attitude and invasive species

Climate change and Covid-19 are both perceived as the direct result of human destruction of the natural world (SELBY, D. and KAGAWA, F., 2020). The term 'Encroachment' has been used to indicate the expansion of human activities into wildlife habitats under the heading of development. The human-centered approach (anthropocentrism) which has been detailed earlier is responsible for the environmental attitude that regards the whole

environment as a servant to human needs. The Wuhan wet markets in China is believed to have contributed to the spread of Covid-19 as there are many species of bats harboring corona viruses sold in that market (DINA F. MARON, 2020). Dark caves are the natural habitats of bats and therefore, any interference with this environment can lead to humans allowing viruses that have never posed a risk to humans before to have an opportunity to mutate into a human form (Yang Yang, 2020).

It has been reported that the biggest threat to biodiversity is the invasive non-native species (Mack et.al, 2000). Examples of these in Scotland include the gray squirrel which poses a threat to the red squirrel, the New Zealand flatworm which poses a threat to the earthworms, and rhododendron which prevents tree regeneration and consequently affecting woodland species composition (Gurnell & Pepper, 1993; Boag, 2000 & Tyler et.al., 2006). A survey of public perception to the eradication of invasive non-native species has revealed that the type of species to be managed affect public opinion (Alison and Kirsty 2007). Programs to control birds were the least supported while the emphasis on the role of awareness and education has been highlighted. Therefore, there is a need to involve the general public as it has been proposed that one important question in the context of invasive species management involves 'what people will consider as invasive species' in the light of the impact of climate change on the way people respond to issues affecting the environment (Abigail, 2020).

Interrelation between climate change and invasive species

A major piece of statistic reveals that in 2016, 4.2 million deaths were linked to air pollution (WHO 2020). These deaths are further categorized into 29% for lung cancer, 24% for stroke, 25% for heart disease and 43% for lung disease. Studies showed that there is a correlation between mortality rates by COVID 19 and air pollution. According to the Center for Climate, Health, and Global Environment at Harvard University, the likability to die from coronavirus is higher in places that are polluted as air pollution is known to weaken the immune system which compromise the ability to fight off infections. Scientists have also suggested that air pollution particles may be acting as vehicles for viral transmission (Isaifan, 2020).

A recent study (Zhu , 2020) on the impact of corona virus on the CO₂ emissions by comparing 2020 with 2019 for the months from January to July on 11 developed industrial countries, revealed that a reduction of up to 18.8% was recorded in Spain in the first 6 months of 2020 in comparison with 2019. Other reductions varied from one country to another as illustrated in Figure 2.

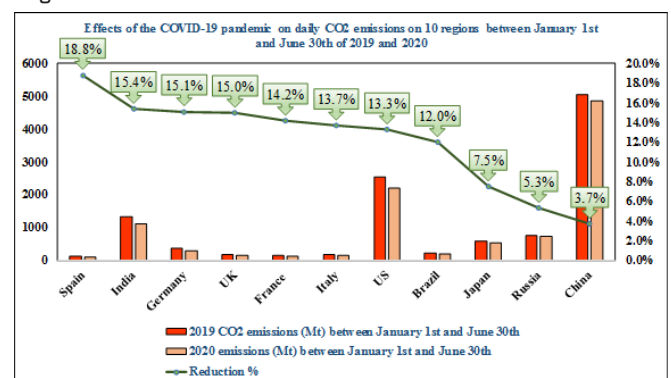


Fig. 2 Daily CO₂ emissions for countries. Effects of the COVID-19 pandemic on daily CO₂ emissions globally and in each of 11 regions are reflected by the shaded differences between January 1st and June 30th of 2019 and 2020.

Other studies stated a reduction in NO₂ gas pollutant; such as in China for example, there has been a reduction in anthropogenic pollution emissions, manifested in 30% reduction in NO₂ levels and 25% in carbon dioxide emissions due to the quarantine measures associated with Covid-19

(NASA, 2020; Lauri, 2020). Also, it has been proposed that temperature and precipitation correlate with the incidence rate of Covid-19 in Oslo/Norway (Menebo, 2020).

It appears that there is a role for air pollution in the severity of Covid-19 cases (Berman and Ebisu 2020). For each 1 ug/m³ increase in fine particulate matter PM_{2.5} exposure, there is an associated risk in terms of Covid-19 mortality (Wu. et.al,2020).

The relationship of climate change with invasive species is further demonstrated in the application of the Thermal-Mismatch Hypothesis (Cohen, et. Al., 2019). Host species can become vulnerable to disease under climate change. The case of the frog (*Atelopus zeteki*) which lives in a temperate climate is subjected to high mortality under the combined effects of the pathogenic chytrid fungus and high temperature. The rare dangerous fungus *C. gatti* is another example of an invasive species that has exploited climate change to appear in the Pacific Northwest of Washington and Oregon away from its natural habitat, the warm waters of Asia, Africa and Australia (Catherine, 2011). An additional example is the West Nile Virus (WNV), a member of the genus *Flavivirus*, which is now endemic throughout the US (Epstein, 2001).

Conclusions and recommendations

- Studies showed that both climate change and invasive diseases have their root in the environmental approach of human being and the model of development that targets the economic growth at the cost of environmental sustainability.
- The spillover of outbreaks like COVID 19 has a direct connection with human activities that disturb natural habitat.
- The pandemic of COVID 19 proved that governments can take radical actions if they want to, something that has not been taken to combat the climate change.
- The crisis of COVID 19 showed that governments have the human rights obligation to protect people from environmental harms including the duty to address climate change as well as loss of biodiversity.
- The coronavirus outbreak is part of climate change crises, which is still a reality that needs to be addressed.

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