

The Pandemic and the Global Environment: Which Way Next?

Juha I. Uitto

Independent Evaluation Office, Global Environment Facility, Washington

Abstract

The COVID-19 pandemic has brought home the fact that humans do not exist outside of the Earth's ecological system. The SARS-CoV-2 coronavirus is zoonotic, meaning it has originated in animals and crossed over to humans. The causes of the increasing occurrence in zoonotic pandemics lie in the higher frequency of encounters between humans and animals (both wild and domesticated). This is exacerbated by how we exploit and abuse the natural environment, and how human influence has become ever more pervasive in the Anthropocene.

The pandemic has revealed significant vulnerabilities even in the North, with severe economic consequences likely leading to an extended recession. Much will depend on how we respond to the crisis and how we approach the recovery. The crisis will present an opportunity to rethink what kind of development we as a society want to pursue. We should take this opportunity to reconsider how to restructure the economy towards more sustainability, respect for nature, equality and participation. The 2030 Agenda recognises the three pillars of sustainable development, but the environment is usually relegated to a subservient role. A certain shift in attitudes is detectable, but powerful interests will push to restore growth at any cost. The slowed economic activity has in a short period resulted in measurable environmental and associated health benefits to arise. Human health and wellbeing are closely related with a healthy natural environment, including ecosystem integrity, clean air and a stable climate. Should we return to business as usual after the crisis subsides, we will pay the price and the next pandemic will be waiting in the wings.

Policy Recommendations

- Future policies and societal directions should be based on the principles of sustainable development considering the social, economic and environmental dimensions in a balanced way. Decision-making must be informed by science.
- More funding—and funding that is sustained and reliable—is needed for medical and other scientific research to help cope with future pandemic risks. This research should encompass both social and natural sciences. Strong public-private partnerships are needed.
- The sustainable development discourse must recognise the close interlinkages between human health, ecosystem health, climate change, disasters, equality and economic development. This also means that environmental concerns other than climate change, such as habitat destruction and biodiversity loss that are directly linked to pandemics must receive more attention.

Introduction

All media are saturated with news and commentary about the coronavirus pandemic, how we're coping with it as individuals and as societies, which countries are doing better or worse than others, should we quarantine ourselves, wear masks going out or are these undue impositions on individual freedoms. As time passes, the debate about finding the right balance between saving human lives and keeping the economy humming is getting more vocal.

Quite a lot has also been written about the perceived silver linings of the pandemic. We've seen satellite imagery of China and the industrial areas of northern Italy showing clearly significantly lower than normal air pollution reflecting factory closures and reduced traffic. In the northern Indian state of Punjab, residents are able to see the Himalayas for the first time in years as air pollution has subsided. We've also seen delightful images of animals reclaiming their rightful place—from mountain lions in Boulder, Colorado, to buffalo in New Delhi and mountain goats in Llandudno, Wales—as the invasive species of humans has retreated (McCoy, 2020). On the other side, new research has also linked air pollution to higher mortality rates from the virus, confirming what was earlier found in the case of SARS (Cui et al., 2003; Friedman, 2020).

Still, despite the few anecdotes of animal sightings in cities, almost all discussions about the environmental impacts deal with atmospheric emissions. This is not surprising, as the media and public discourse seems to be able to focus only on one topic at a time. Consequently, other equally important environmental concerns related to habitat destruction and biodiversity loss that actually may be more acutely linked to pandemics go largely unnoticed.

The 2030 Agenda for Sustainable Development and the attendant Sustainable Development Goals adopted by nearly all United Nations Member States are conceived as integrating social, economic and environmental dimensions. In practice, however, the environment is nearly always

relegated to a subservient role (Reid et al., 2017). Deforestation continues unabated and entire ecosystems are sacrificed to give way to agricultural and urban encroachment and the expansion of transport networks in the name of development.

On the social side, we've seen some positive developments. There seems to be some more appreciation for people on the frontlines, whether they be doctors or nurses or people who provide other necessary services to keep all of us safe and fed, from farmers and supermarket workers to police officers and lorry drivers. There may even be some increased appreciation for science and expertise. At the same time, there have been baser reactions, of blaming the perceived other. There have been more than 750 documented racist incidents against Asians since the beginning of the pandemic in the USA. It doesn't help that President Trump has insisted on calling it the "Chinese virus."

The question on top of my mind is whether anything will change, whether we will learn anything from this global crisis or will we go back to business as usual as soon as we can. I am not too optimistic. There was a chance to change the way we do things after the 2008 financial crisis, but the world rushed back to turbo charging the economy along exactly the same model as before, with incentives for carbon intensive development, cutting financial, environmental and labour regulations. Recognising that a pandemic response requires government leadership, powerful voices like *The Economist* are already pre-emptively warning that governments may not give up their new powers after the pandemic is over (see, e.g., leader in the 26 March 2020 issue).

Yet, if we do not substantively mend our ways after the pandemic, we have yet again squandered a chance—perhaps our last one—to set a more sustainable course to deal with pressing global problems of environmental degradation, biodiversity loss, climate change, inequality and vulnerability. And the next pandemic will already be waiting in the wings.

How did we get here?

It is no mystery where the pandemic came from and why such pandemics are getting more frequent. HIV, SARS, H1N1, Ebola, MERS, Rift Valley fever, West Nile virus, Zika and COVID-19 all are zoonotic, i.e. they have their source in animals. As human activities have continued to expand further into previously undisturbed natural domains and as our interactions with domestic and wild animals have become increasingly close, we have given ample new opportunities for pathogens to spill over from non-human animals to humans (Quammen, 2020). The only thing we do not know for certain is the exact source of COVID-19.

Although it is still somewhat disputed, there is reason to believe that the virus itself, SARS-CoV-2, [originated in bats](#)¹, but how it got transferred to humans is unclear. There are a number of possibilities. One theory suggests that a farmer in China who had collected bat guano to fertilise his fields got infected first. Another suspect is a “wet market” in Wuhan, a bustling megacity in the central Chinese province of Hubei where the virus was first detected. In the market, like in many other markets of its kind, all sorts of live animals from civets to pangolins to snakes were for sale to discerning consumers. The animals were kept in horrible conditions, in small cages stacked on top of each other whereby all possible bodily fluids from the top of the pile were leaking and seeping to the ones below. The animals were either butchered on the spot or sold live to customers. It is said that most Chinese do not consume these wild animals. They are prestigious and expensive and therefore reserved for a wealthy elite who, falsely, believe that these animal products contribute to what is known as Traditional Chinese Medicine (TCM)²: the rarer the animal, the more potent the potion, or so it is believed by some.

¹ At the same time, the Secretariats of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), the Agreement on the Conservation of Populations of European Bats (EUROBATS) and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) issued a joint statement emphasising that there is no evidence that bats

Another place where such wild animal markets thrive is Africa, especially the Congo Basin and Central African rainforests where people hunt for bush meat—including apes and monkeys that are genetically very close to us—to supplement their often meagre diets. This is how the AIDS and Ebola viruses crossed over to humans. In both cases there are some positive signs to be seen. Many people seem to have been scared away from hunting and eating our primate cousins. In the wake of COVID-19, China has decided to close these open wild animal markets (and as a positive by product, the southern city of Shenzhen has even banned the eating of cats and dogs). Still, TCM is promoted in China as a potential cure for the virus (Cyranoski, 2020).

A third line of investigation suggests that the COVID-19 pandemic is a result of the virus accidentally escaping from a laboratory in Wuhan researching coronaviruses in bats. This theory is lent some credence by the fact that the first known person infected with the virus had not visited a wet market. The Chinese government has also banned foreign investigators from the laboratories and prevented knowledgeable scientists from discussing the matter, thus inevitably fuelling speculation. It must, however, be noted that there is no evidence that the virus would have been intentionally modified.

Irrespective of the immediate causes of the current case, the root causes of this—as well as past and future—pandemics are clear. We live in the Anthropocene, a new geological era where human activity is so expansive and prevalent as to profoundly alter the Earth’s geosphere and biosphere. We are changing the climate and have destroyed ecosystems by encroaching deep into uncharted territories by building roads, expanding farmland for food production, logging and

directly infected humans with COVID-19 and that scientific investigations are pointing to a chain of events that may have involved bats but most likely only through an intermediate animal.

² It is important to note, however, that TCM is a much broader field and is widely used both in China and [increasingly elsewhere](#), including the West.

mining for more natural resources, transforming previously natural landscapes through urbanisation and, suburbanisation. These encroachments have created the ideal conditions for the spill-over of pathogens from non-human animals to humans (Vidal, 2020). While the pandemic has shown in no uncertain terms that the human species is very much part of the Earth's ecological system, it is also clear that we have overstretched our boundaries through excessive growth of the economy, industrial activity, settlements and the human population itself.

What is sad is that the pandemic should not have come as a surprise to anyone, despite of what any politician has claimed. The exact timing or the exact strain of virus may have been impossible to predict accurately, but the fact that a pandemic was coming was known for a long time. In fact, viral outbreaks have become increasingly frequent over the past three decades. Zoonoses constitute more than 60% of infectious diseases and three-quarters of emerging infectious diseases in the world (Asokan & Asokan, 2015). The UN Environment Programme in its 2016 report dedicated a chapter to zoonoses under the heading "blurred lines of emergent disease and ecosystem health" (UNEP, 2016). Experts, such as David Quammen, the author of the bestseller on the topic *Spillover* (Quammen, 2012), and Peter Daszak, President of EcoHealth Alliance (Harris, 2020) have for years sounded alarms about the imminence of the threat, as have the principals of the Bill and Melinda Gates Foundation who have funded much of the global work on epidemics as governments have dithered. Even the Trump administration conducted a pandemic simulation just last year but obviously no-one in a position of power paid any attention.

The ultimate invasive species

What drives these processes are the same matters that drive climate change, species loss and all environmental degradation: economic growth, and the quest for more resources and space for humanity. This is understandable, as human numbers keep growing. There are today more than 7.5

billion people on the planet and, even with slowing global growth, we will inevitably add another 2 billion or so people to the fray (unless another, more virulent pandemic gets us before that). Despite the increasing wealth across the world, there still are 736 million people living in extreme poverty [according to the World Bank](#), while almost half of the population lives with less than US\$5.50 a day. Inequality has grown to intolerable proportions: [according to Oxfam](#), the world's richest 1% has more than twice the wealth than the bottom 6.9 billion people. All of those who still lack in basic needs and acceptable living standards must be allowed to strive for improved conditions for themselves, but it would be impossible for all people on the planet to consume as much as we in the North do. It has been calculated that if all people alive today were to consume at the level of an average American, we would need 4.8 earths to support the human population (Tucker, 2019: 160). The rich world consumes more than ever, but still everyone wants more. Traditional economic theory is based on constant growth and the alternative is stagnation and slow death. Virtually every government, irrespective of which ideology they nominally adhere to, buys into this illusion. The quest for growth at the macro level, and greed and selfishness at the individual level, are the most serious threats to the global environment and the downfall of humanity.

Fundamentally, there just are too many people for the planet to support sustainability and harmony with rest of the nature. In one of the most important books of recent years, my fellow geographer Christopher Tucker (2019) convincingly argues that Earth could sustainably support perhaps 3 billion people—the global population number as recently as 1960—taking into account variations in planetary ecosystems, biodiversity, consumption and technology. Humans are the ultimate invasive species taking over all habitable space on Earth and pushing all other species, animals and plants to ever smaller, fragmented areas.

The entire debate on sustainable development has largely ignored the issue of population growth. Discussing human

population is highly politicised and almost a taboo. Those on the right—and traditional economic thinking—see a growing population as supplying necessary workers and consumers to the economy. Aging and the eventual shrinking of population is seen as major threats to economic growth. Many religions still think in terms of the Biblical command to “multiply and fill the earth” and see the natural world as the dominion of man (and its nearly always just man). There still are nationalist leaders and tin-pot dictators who think that a large population will allow them to dominate over their neighbours or minorities in their own countries. This same thinking is prevalent among nativists and white supremacists in Europe and North America when they talk about “replacement.”

The left for its part screams that those expressing concern about population growth are blaming the victim, as it happens to be predominantly the poor and some minority groups who have many children. Few seem to accept the inevitable math that unlimited population growth on a limited planet is an impossibility, especially as consumption levels are on a constant rise. The good news here is, though, that according to all projections, the global population will start declining after reaching a peak later in this century—following the development path we already see in East Asia and Europe—unless, again, an ecological catastrophe does us in before that.

There simply isn't enough of space for people to house and feed themselves without encroaching on the space of other species. Cities would seem to be better than suburbanisation and urban sprawl as this will allow us to concentrate our footprint on a smaller area and reduce the need for transportation, which is generally environmentally destructive. It will also allow for innovations such as vertical agriculture (admittedly harder for cattle raising, adding to the case for more plant-based diets). On the other hand, as so vividly demonstrated by New York, the megacity that has emerged as the epicentre of the current COVID-19 crisis in the USA, cities with their dense populations also provide easy places for viruses to spread once they grab a foothold.

What has changed?

At the face of it, it would seem clear that the current pandemic has acted as a wake-up call to much of humanity and that there will be consequences on how we do things and how we interact with each other in the future. The question is how profound will these changes be and whether they will survive the end of the pandemic. At the individual level, we've already seen a number of behavioural changes. Social distancing (a better term would be physical distancing) has taken root and, more importantly, the crisis that has forced us all to spend time at home and has seen several rich and famous people—from Boris Johnson to Tom Hanks—contracting the virus, has made people reconsider their priorities in life. I've seen and heard people question the glory of the rat race, chasing money and power when it can so easily be taken away from you. These are all positive sentiments.

The pandemic has hit pause on economic activity and we should take this opportunity to rethink growth and what kind of development we want when we push start again. We should reflect on how we could restructure the economy towards more sustainability and less emphasis on raw growth. I'm afraid this will not happen, as governments and other actors will be rushing to boost growth immediately once the various degrees of lockdown around the world start easing up. That is exactly what happened after the 2008 financial crisis, as huge amounts of money were pumped into economies all around the world especially in carbon intensive sectors, such as construction, energy and transport.

We are already seeing that happening, although the current crisis is not even over yet, as governments are already providing crutches to the global airline industry. This is an industry that has grown uncontrollably over the past decades—in 2019 there were 3 billion airline passengers globally (as if everyone alive in 1960 had taken a flight!)—with massive climate impacts. In the US, flight bookings are down 95% since March and it will take time before they bounce back. It seems likely that there will at least be a

slowdown in the growth in air travel over the coming years, partly because the months that we've spent sheltering in place have shown that doing business through virtual meetings and other remote tools works well and reduces costs both to the companies and the individuals.

An area where I perhaps see more hope is in the growing realisation of the need for more self-reliance on food and medical security. Over the past few decades of neoliberal hubris, a simplistic business logic has dominated even over government decisions regarding strategic security issues. The only criterion has been "efficiency" defined in very narrow terms of reducing short-term costs. By this logic, production has moved to the cheapest location and supply chains have become long and globalised.

Today, the basic ingredients for fundamental medicines are produced in China and India. The USA used to have a thriving industry, but the cheaper production costs in Asia compelled it to close down. This thinking penetrated even social democratic Sweden, where the government sold its strategic stockpiles with the idea that they can always rely on the market to purchase what they need on a just-in-time basis, only to find out that critical supplies are not available in adequate quantities now that there is a pandemic (neighbouring Finland, having always been prepared in case of an attempted invasion by its big and unpredictable eastern neighbour, never gave up its stockpiles, which now have proven an advantage) (Anderson & Libell, 2020). Such just-in-time supply chains make sense for businesses in normal times, but not for governments and societies that need to be prepared for an emergency.

Now we realise how short-sighted these decisions have been—according to Suzanne De Treville of the University of Lausanne, many business people are questioning how such stupid decisions could have been taken at the time (Jaberg, 2020). The current crisis will give an opportunity to rethink this strategy as well. I realise this notion appeals to those with an isolationist bent, who want to close doors, limit trade and the movement of

people. That should not be the intention: only that we do not leave ourselves at the mercy of long global supply chains when they could be disrupted for various reasons during national emergencies. And long global supply chains themselves also have environmental impacts, as they require long-haul transportation.

We have for long confused globalisation with the domination of large businesses with global operations always moving to the location of lowest cost. A better form of globalisation would be one where information and ideas flow freely around the globe in a decentralised democratic system but where regions still remain more self-reliant and autonomous. Global problems like a pandemic require global—as well as local, national and regional—responses. International and global cooperation and coordination are a must. Yet, more decentralised systems will also be more crisis-resilient and allow for countries and localities to cope with disruptions.

Are we at a turning point?

A rather lively debate is emerging around whether this crisis will prove to be a turning point. The always sober-minded Richard Haass wrote in *Foreign Affairs* (Haass, 2020) in rather pessimistic terms that the pandemic will mostly accelerate trends that are already underway. These include reinforcing the "democratic recession," growing nationalism, and lack of global leadership. Unfortunately, it would also hamper international cooperation around global challenges such as pandemics and climate change. Interestingly, the gist of Haass' article predicted partially similar trends as John Gray's piece in *New Statesman* (Gray, 2020), which had almost the opposite title: "Why this crisis is a turning point in history." I think both of them are probably right. One can see elements of the predictions either in a negative or in a positive light.

Reflecting on the depressed oil prices, which he believes will never bounce to pre-pandemic levels, Michael Grubb of University College London (Grubb, 2020) notes that the pandemic occurred against the backdrop of

raised concerns about climate change. The world has experienced a number of climate-related extreme events (the latest of which shocked the world were the Australian wildfires of 2019). At the same time, Prof. Grubb observes that the virus has revealed advanced societies to be much less resilient than most of us thought. The combined effects would lead people to rethink their lifestyles and priorities.

Contrast this sentiment with that prevalent among the political and capitalist classes. On 26 March 2020, following a virtual emergency summit, the G20 leaders issued a communique that committed the countries to “do whatever it takes ... to minimise economic and social damage from the pandemic, restore global growth, maintain market stability, and strengthen resilience” (cited in Stiglitz, 2020). Furthermore, many commentators reject the notion that we should stop pursuing growth, either of the economy or human population, arguing that not only is limitless growth possible—this being simply a function of not resource extraction but of technological efficiency of how we transform matter and energy into economic value—it is also necessary to lift poor people out of poverty and to create increased wealth to go around. They argue that large-scale capitalism is the only way to do this, rejecting any redistributive efforts as counterproductive. For many reasons, including moral and ethical, I reject this argument, instead siding with thinkers like Jason Hickel who have argued that green growth is an oxymoron (Hickel, 2018) and renewable energy often touted as panacea has its limits (Hickel, 2019). Instead of continued growth as an objective, we should aim for a steady-state economy³. As argued by Kate Raworth, we need to focus on creating an economy that is regenerative, where resources are reused and recycled, and redistributive, so that those still living in poverty can be lifted out of their situation, while we ensure that we do not overshoot the ecological boundaries of the planet (Raworth, 2017).

The proponents of eternal growth invariably also ignore the implications to nature and the rest of the species. Perhaps—just perhaps, as we really do not know—humankind could continue to exist in a world without the natural environment as we know it, where freshwater was desalinated from the sea, tiny nano-bots could do the work of pollinators that had long since become extinct, and virtual reality could provide relief to the weary minds. Perhaps elephants and penguins and pandas and other such animals do not fill a central ecological niche and we could indeed survive without them. But wouldn't that be an impoverished existence? Is that the kind of world we would like to leave to our children?

What I hope would remain?

While I see signs of hope that there may be some sea change underway, I am not hopeful that we really are at a turning point. The interests advocating for a return to business as usual are very powerful. They control not only the financial resources, but through them also the politicians and to a large extent the media, thus deciding the terms of the discourse, of what is seen as possible. The era of hyper-globalisation may be over, aided by the COVID-19 crisis; but there was already a popular backlash against globalisation that had left too many people behind. There will be more protectionism, more government intervention and efforts to make sure critical industries are producing domestically for food and medical security. Trade will continue, of course, but may not thrive as in the past few decades. Travel will bounce back, too, but will probably not continue its exponential growth.

The recession that follows will be quite long and developing countries may suffer the most, as usual, which may give a boost to the aid industry, like the World Bank Group and IMF. This may not extend to the environment area, unless some insightful politicians actually connect the dots between environment, health and security, which seems unlikely but not impossible. Borders will be closed to refugees. US influence (and soft power) will continue to decline and Europe will continue to splinter and bicker,

³ <https://steadystate.org/>

while China will continue to rise, but not enough to take global leadership anytime soon. The former prime minister of Australia, Kevin Rudd argues that both China and the USA have lost power as a consequence of mishandling aspects of the crisis and will emerge significantly diminished (Rudd, 2020). Still, in a multipolar world, the centre of gravity will again move further to the east (Traub, 2020). Indeed, countries like South Korea and Singapore showed better leadership in dealing with the crisis than did the West.

Perhaps most acutely, I hope that the pandemic will lead to a renewed respect for nature. This must go hand in hand with trust in science and expertise. I know for a certain part of the population this will not happen. They are too far down the rabbit hole of anti-intellectualism and distrust of “elites.” Populists around the world have spent years, irresponsibly, sowing the seeds of this distrust for their own purposes. Still, even they are now in retreat as the realities of the pandemic are catching up with them. In America, anti-intellectualism has deep roots that go back at least to the 19th century, as demonstrated by Richard Hofstadter in his classic 1962 work. Still, the majority of Americans have a basic respect for science, even if they (like all people) like to pick and choose what they believe (Campbell and Griffin, 2017). I hope that it has become evident during the pandemic that spin, demagoguery and wishful thinking don’t carry the day when the going gets tough.

We need more research—and we need more funding for research and this funding must be sustained and reliable. It should cover health in a broad sense, thus not only medical science but also the socio-ecological dimensions of health. There are reports that virologists and medical scientists were close to developing a coronavirus vaccine just a few years back—then funding dried up. Politicians who could not see beyond the next election had other priorities. Pharmaceutical companies couldn’t see immediate profits in it. So here we are. There’s little reason to believe it would be different next time around, but perhaps there is a new sense of urgency. Public funding and public-private partnerships

will be necessary to capture it, whereby governments fund research and guarantee purchases from firms and laboratories that develop needed vaccines and drugs.

Evaluation is needed to ascertain that the policies, strategies, programmes and projects that we launch contribute effectively to the solutions. Evaluation has the specific role of enhancing our knowledge and understanding of what works, under what circumstances and for whom, based on a systematic analysis of past experiences. To be effective, evaluation must evolve away from a mechanistic project-oriented outlook to embrace a holistic view (Patton, 2020). As evaluators, we must be able to provide evidence of how actions in the economic and social spheres affect the natural environment and vice versa. We must be able to demonstrate the close interlinkages between the human and natural systems in light of evidence from the real world, while anchoring our work in scientific knowledge.

I also hope that there will be a realisation that we need more government regulation and social safety nets. Only governments can put in place the coordinated responses, mobilise the resources, and put in place policies to support people and small businesses falling on hard times. Civil society also has a key role to play in mobilising people and public opinion from the local to the national and global levels.

These are indeed global challenges requiring global responses and cooperation. International organisations, like the UN as well as international NGOs, are needed to initiate and coordinate action. Unfortunately, the temptation is to look inward, close borders, hoard medical and other resources and reserve them to one's own people. The blame game and suspicions between the USA and China are not conducive for much needed scientific cooperation. Precisely the wrong response was that of the US announcing on 14 April 2020 that it would halt funding to the WHO. The organisation’s response had been less than perfect—it too operates in the arena of world politics—but this is the time when all countries must

cooperate and coordinate their actions around common platforms.

Most of all, I hope that there will be a broader realisation that pandemics, such as the current one are the direct result of our abuse of nature, as we in our greed encroach deeper and deeper into hitherto undisturbed ecosystems and give pathogens the chance to cross over from animals to their new human hosts.

Importantly, our discussions about sustainable development must become more intelligent. Currently, these discussions tend to be dominated by social and economic issues, with climate change thrown in to represent the environmental dimension. It is important to realise that these three pillars of sustainable development are inseparable. All social and economic development rests on the biophysical foundation of the natural environment which we as humans depend upon. It is essential to broaden the environmental discourse beyond climate change to take full account of biological resources, land, forests, water, oceans—and the interlinkages between these natural systems and the humans who inhabit them as part of the ecosystem. And pandemics must be incorporated into any future sustainable development discussions and plans (Di Marco et al., 2020).

Even if you don't share my opinion of the intrinsic value of nature or solidarity with other species and the rights of non-humans, your sense of self-preservation should tell you that the current trajectory is dangerous. If we do not mend our ways and continue our wanton destruction of the planet, we will pay the price. We will soon bounce back from the COVID-19 crisis, but the next pandemic is already waiting in the wings. Avoiding future crises that may become infinitely more disastrous, we must seriously and urgently rethink development, our values, so that we can co-exist in harmony among ourselves and with the rest of species that inhabit the Earth. We ignore the biophysical foundations of our wellbeing at our own peril.

Juha I. Uitto, Independent Evaluation Office,
Global Environment Facility, 1818 H Street,
NW, Washington, DC, USA.

juitto@thegef.org

References

- Anderson, C. & Libell, H.P. (2020). Finland, 'prepper nation of the Nordics,' isn't worried about masks. *The New York Times* 5 April 2020. [<https://www.nytimes.com/2020/04/05/world/europe/coronavirus-finland-masks.html>]
- Asokan, G.V. & Asokan, V. (2015). Bradford Hill's criteria, emerging zoonoses, and One Health. *Journal of Epidemiology and Global Health* 6: 125-129.
- Campbell, T.H. & Griffin, L. (2017). Who are you calling anti-science? *Scientific American*, 6 April 2017. [<https://blogs.scientificamerican.com/guest-blog/who-are-you-calling-anti-science/>]
- Cui, Y., Zhang, Z.-F., Froines, J., Zhao, J., Wang, H., Yu, S.-Z. & Detels, R. (2003). Air pollution and case study fatality in SARS in the People's Republic of China: An ecologic study. *Environmental Health* 2: 15 doi: 10.1186/1476-069X-2-15. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC293432/>]
- Cyranoski, D. (2020). China is promoting coronavirus treatments based on unproven traditional medicines. *Nature* 6 May 2020. [<https://www.nature.com/articles/d41586-020-01284-x>]
- Di Marco, M., Baker, M.L., Daszak, P., Eskew, E.A., Godde, C.M., Harwood, T.D., Herrero, M., Hoskins, A.J., Johnson, E., Karesh, W.B., Machalaba, C., Navarro Garcia, J., Paini, D., Pirzi, R., Stafford Smith, M., Zambrana-Torillo, C. & Ferrier, S. (2020). Opinion: Sustainable development must account for pandemic risk. *Proceedings of the National Academy of Sciences*. 25 February 2020. [<https://www.pnas.org/content/117/8/3888>]

Friedman, L. (2020). New research links air pollution to higher coronavirus death rates. *The New York Times*, 7 April 2020.

[<https://www.nytimes.com/2020/04/07/climate/air-pollution-coronavirus-covid.html>]

Gray, J. (2020). Why this crisis is a turning point in history. *New Statesman*, 1 April 2020.

[<https://www.newstatesman.com/international/2020/04/why-crisis-turning-point-history>]

Grubb, M. (2020). Why oil prices will never recover. *Asia Times*, 16 April 2020.

[<https://asiatimes.com/2020/04/after-the-storm-why-oil-will-never-recover/>]

Haass, R. (2020). The pandemic will accelerate history rather than reshape it: Not every crisis is a turning point. *Foreign Affairs*, 7 April 2020.

[<https://www.foreignaffairs.com/articles/united-states/2020-04-07/pandemic-will-accelerate-history-rather-reshape-it>]

Harris, M. (2020). A warning from a scientist who saw the coronavirus coming. *Slate*, 5 March 2020.

[<https://slate.com/technology/2020/03/coronavirus-covid19-pandemic-cause-prediction-prevention.html>]

Hickel, J. (2018). Why growth can't be green. *Foreign Policy*, 12 September 2018.

[<https://foreignpolicy.com/2018/09/12/why-growth-cant-be-green/>]

Hickel, J. (2019). The limits of clean energy. *Foreign Policy*, 6 September 2019.

[<https://foreignpolicy.com/2019/09/06/the-path-to-clean-energy-will-be-very-dirty-climate-change-renewables/>]

Hofstadter, R. (1962). *Anti-intellectualism in American Life*. Vintage Books: New York.

Jaberg, S. (2020). Coronavirus catches managers off guard. *Swissinfo.ch*, 19 March 2020.

[https://www.swissinfo.ch/eng/business/covid-19-and-globalization_coronavirus-catches-managers-off-guard/45624906?fbclid=IwAR1VeVF6QJnCVQJXg9]

[[mezrpldtUsktzMXtg21C-8mnWHLyZ20wC4fpJgkHo#.XnMy6vZXaRw](https://www.washingtonpost.com/world/the_americas/coronavirus-wild-animals-wales-goats-barcelona-boars-brazil-turtles/2020/04/14/30057b2c-7a71-11ea-b6ff-597f170df8f8_story.html)]

McCoy, T. (2020). As humans stay indoors, wild animals take back what once was theirs. *The Washington Post*, 15 April 2020.

[https://www.washingtonpost.com/world/the_americas/coronavirus-wild-animals-wales-goats-barcelona-boars-brazil-turtles/2020/04/14/30057b2c-7a71-11ea-b6ff-597f170df8f8_story.html]

Patton, M.Q. (2020). *Blue Marble Evaluation: Premises and Principles*. Guilford Press: New York.

Quammen, D. (2012). *Spillover: Animal Infections and the Next Human Pandemic*. W.W. Norton: New York.

Quammen, D. (2020). We made the coronavirus epidemic. *The New York Times*, 28 January 2020. [<https://www.nytimes.com/2020/01/28/opinion/coronavirus-china.html>]

Raworth, K. (2017). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Random House Business: New York.

Reid, A.J., Brooks, J.L., Dolgova, L., Laurich, B., Sullivan, B.G., Szekeres, P., Wood, S.L.R., Bennett, J.R. & Cooke, S.J. (2017). Post-2015 Sustainable Development Goals still neglecting their environmental roots in the Anthropocene. *Environmental Science and Policy* 77: 179-184.

Rudd, K. (2020). The coming post-COVID anarchy. *Foreign Affairs*, 6 May 2020.

[<https://www.foreignaffairs.com/articles/united-states/2020-05-06/coming-post-covid-anarchy>]

Stiglitz, J.E. (2020). Internationalizing the crisis. *Project Syndicate*, 6 April 2020.

[<https://www.project-syndicate.org/commentary/covid19-impact-on-developing-emerging-economies-by-joseph-e-stiglitz-2020-04>]

Traub, J. (2020). The future is Asian—but not Chinese. *Foreign Policy*, 27 April 2020.

[<https://foreignpolicy.com/2020/04/27/the->]

[future-is-asian-but-not-chinese-coronavirus-pandemic-china-korea-singapore-taiwan/](#)]

Tucker, C. (2019). *A Planet of 3 Billion: Mapping Humanity's Long History of Ecological Destruction and Finding Our Way to a Resilient Future*. Atlas Observatory Press.: Washington, DC.

UNEP (2016). *Frontiers 2016: Emerging Issues of Environmental Concern*. United Nations Environment Program.

[<https://www.unenvironment.org/resources/frontiers-2016-emerging-issues-environmental-concern>]

Vidal, J. (2020). Destroyed habitat creates the perfect conditions for coronavirus to emerge. *Scientific American*, 18 March 2020.

[<https://www.scientificamerican.com/article/destroyed-habitat-creates-the-perfect-conditions-for-coronavirus-to-emerge/?fbclid=IwAR3Vw3IKfN6chSiH7Tq7lvOYoyHoQUpnGfIKdUMKQt7roNwRieHbbd9dfaA>]