

Letter to the Editor

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Letter to the Editor in reply to Diamandis
“COVID-19 and the Le Chatelier’s principle”<https://doi.org/10.1515/dx-2022-0064>

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To the Editor,

Hereinafter, we present our views in sequel to the Opinion Paper “COVID-19 and the Le Chatelier’s principle” [1] that we read with interest.

The emergence, outbreak, and widespread deleterious impacts of the COVID-19 pandemic are etched in world history. Climate change impacts manifesting as extreme cold, unprecedented heat waves, hurricanes, cyclones, typhoons, flash floods, droughts, gradual sea level rise and climate change refugee problems are another set of adversities living beings are surviving. This list of adversities also includes desertification, land degradation, water pollution, air pollution, climate migration, depletion of natural capita, wars and their ensuing devastation, poverty, unsafe agricultural practice, food security issues, and the fast spread of diseases and viruses.

There is a pressing need to elucidate the links between climate change and the emergence of infectious diseases because of the considerable threats these climate change-related phenomena and disease outbreak pose to living biota. Gratifyingly, some reports have discussed these complex connections from different angles. Williams et al. [2] gave insights on the influence climate change and biodiversity collapse exert on infectious diseases’ world-wide emergence and spread. Ogden and Gachon [3] opined

that climate change will probably drive the emergence of infectious disease in Canada. Semenza and Paz [4] discussed eye-opening aspects on climate change contributing to disease incidence and prevalence in Europe.

What can and what has to be done in the face of these ever-growing global threats and scourges? These are the perpetual questions every society is struggling to address within its specific constraints. Ideally, a world promptly freed from all that culminates in causing climatological and environmental health issues is what can be wished for. Unfortunately, this is not a realistic possibility. Thus, we align ourselves to the notion of ‘not going back to the Stone Age’ of Diamandis [1]. This eventuality is unfathomable because of the entropy it would plausibly induce in our daily lives were it to ever begin happening in something vaguely matching a ‘Stone Age-like’ existence.

Diamandis [1] concluded with “*If we continue to perturb the equilibrium on the planet we should be ready to face the inevitable counter-changes and pay the associated price.*” This conclusion is undoubtedly pertinent today where either a ‘business as usual’, ‘no action’ or ‘delayed action’ approach is no longer an option. The clarion call from *Nature* to re-engineer our worldly activities is more than ever clearer, louder, relentless, and, in a sense, almost punitive. Beginning from scratch, or not, can be a case-to-case decision. ‘Clearer’ because there are now more frequent ‘natural’ calamities. ‘Louder’ because of the unprecedented intensity and gravity of impacts these more frequent events unleash. ‘Relentless’ because they are disastrous, difficultly predictable but yet manifesting in many regions of the globe; and ‘punitive’ because *Nature* is ‘retaliating’, almost out of a survival instinct to recover and reinstate stability against the ‘harm and disturbance’ anthropogenic activities continue causing to Her.

We reach these views in response to the outspoken statement of Diamandis [1]: “*And we, the greedy creatures, did not realize as yet that the more we expand our greediness, the rest of the planet will resist and strike back, as per Le Chatelier.*”. These questions then distil:

- (i) How earnestly does one understand the nexus of living life as a harmonious living entity and *Nature*’s rule of life and survival?

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- (ii) How clearly does one realize the irreversible impacts anthropogenic activities have caused to *Nature*?
- (iii) What margin of resilience *Nature*'s is left with for restoring a desired pristine balance of *Nature*?
- (iv) In line with the omnipresent Le Chatelier's principle [1], then, assuming the critical margin of natural recovery is gradually instilled, how fast can the existing damage be repaired and its long-lasting effects be curbed, mitigated, stopped, or undone?
- (v) The 'greed' factor so unequivocally stated by Diamandis [1] is also sadly our conclusion since quite some time. That much time which elapsed for us to grasp the implications and effects of the do's, don'ts and wish-list we all have. Out of the fundamental right of equity to life and the fundamental right to reap the goodness *Nature* offers to us all, progress in pursuit of yet more happiness, yet more comfort and more data have proliferated. The pace and quality of progress, we fear, may be now regarded as a double-edged sword.
- (vi) If one conquers with this 'double-edged sword' attribute of worldly progress, then a next question manifests itself: How *ready* are we to manage our needs and expectations? How ready are we all for initiating and sustaining a balanced and gradual limit to our growth?
- (vii) Whether the limit to growth can be gradual or abrupt is another salient question. As it seems in current times, gradual or abrupt limit to growth seems to be always caught up with a fresh episode of challenges imposed by *Nature*.

It appears to be now a hard coded behavior in many of us to start reflecting and responding, in our very own ways and within our own reach of possibilities, to do whatever may constitute plausible remedial actions to flatten, and then hopefully, curb the global damage curve. Besides the very personal changes one may choose to bring in one's day-to-day activities ("Changing perspectives" in Diamandis [1]), a plethora of local, regional and global initiatives in developing and implementing renewable energy programs, water purification and water recovery systems, better waste management, greener industrial production routes, sustainable production and consumption, and better and faster medical treatment and sanitation constitute Mankind's response actions against what antagonize its survival. Survival at any cost. But, really at any cost?

One overarching lesson is clear: the retaliation mechanisms of *Nature* to restore her balance and rules of the game should be well understood first. Then, these have to

be respected in their true sense, both in thought and action. Reaching the goal of a restored balance of *Nature* appears much to be shared both by *Nature* (naturally!) and all living beings. How fast and constructively this goal will be attained, and by whom first, entails a clear adoption of a new paradigm of living and livelihood. Are we ready to fully realize that to the great 'evils' menacing us all, great remedies become incumbent? How 'great' the remedy needs to be depends on how readily we can individually change our habits to moderate our growth. For we should also bear in mind the complex socioeconomic fabrics an overwhelming portion of the world population lives in. Incepting new habits may be faced with resistance at multiple levels.

A global makeover appears much to be in the making at *Nature*'s level. Are we all totally in sync with it? The answer to this question is probably 'Yes, to some extent.'. Despite the differing paces at which remedial actions are being implemented by Mankind to address infections and loss of environmental quality, the very enactment of the Sustainable Development Goals [5–8] and the subsequent project activities bear testimony to two key things. First, they point to the realization that the cost of inaction is counter to survival of life. Secondly, survival can no more be a reactive adaptation process. Gratifyingly, it is transforming into a more conscious approach that is slowly becoming more understandable and understood.

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