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Short Communication



# Climate Change, Its Future and Relation to Public Health

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## Introduction

This *pre-dictum*, prologue in 21st century language, should be a stimulus to change customs, objectives and ethics of our current civilization, in which everything is allowed …. just for a few people: *quod licet Jovi, non licet bovi*. During its existence, planet Earth has been subjected to enormous catastrophes, such as those caused by an impact of an extremely large meteorite or an explosion of a super volcano; after those events, the planet has survived but most of the species become extinct. Those who survived, mutated, proliferated, and created an de novo rich biodiversity, with species adapted to the new existing conditions. Apparently, we are heading the same way again - history repeats itself - an invasive species, *Homo sapiens*, that is ourselves, *human humanum lupus est,* we have destroyed numerous ecosystems, we have contaminated water, soils and air with toxic substances, and we have emitted "greenhouse" gases, which are causing warming of the atmosphere and the subsequent climate change [1]. Under these conditions, numerous animal and plant species have already been extinct, and the frequency and intensity of extreme weather events increased, many of them becoming catastrophic. The world of science warns us that we are facing a sixth mass extinction of species on earth, even suggesting us a change of era, that we are already living the Anthropocene.

Scientists projections indicated that these consequences will continue intensifying. The Paris Agreement objectives intended to keep the planet warming well below 2ºC and preferably 1.5ºC, relative to the pre-industrial era. The difference between "where we are likely to be" and "where we need to get" to achieve the Paris Agreement objectives, is known as "emissions disparity" (ED). Current commitments contained in National Level Contributions (NLC) are not adequate to eliminate the ED by 2030. Technically, it is still possible to eliminate ED to keep the planet warming well below 2ºC and 1.5ºC; however, if NLC aspirations are not increased by 2030, it will no longer be possible to avoid exceeding the 1.5ºC target. Current NLC based trajectories lead to a global warming of 3ºC by 2100. The Paris Agreement objectives could only be achieved if the proposed measures are accepted and met by all the world countries [2]. Otherwise, consequences will be catastrophic: extension of tropical diseases to non-tropical countries, deaths from hyperthermia and dehydration, organic, neurobehavioral or psychiatric pathologies caused by exposure to chemical agents, stress or nutritional deficiencies. High magnitude forest and tundra fires, mostly artificially caused since they are supposed to economically benefit a small percentage of the population, will increase greenhouse gases in air and decrease their removal. Rising seawater levels flooding of coastal areas as well as devastating droughts will trigger massive migrations to less affected countries. All the above can lead to armed conflicts, which can spread to many countries of the world. If thermonuclear weapons are involved, the conflict may cause the end of our civilization, as we know it [3]. If human survivors remain, let us hope that a "mutation" will affect their social consciousness, and allow their evolution from *Homo sapiens* to *Homo conscientiam.*

Most scientists believe it has been demonstrated that the responsibility for most global warming is anthropogenic [2]. Against this position, numerous myths have been built that would reflect the negationism and hypocrisy of the United States and some other countries, as well as the consortium of the oil industries, in relation to climate change, blaming others as a way of not assuming responsibility for global warming. Here, commitments of governments and countries should be more generous contributing real sacrifices reducing emissions as required, instead of compromising the minimal possible efforts, as it was shown in recent United Nations Climate Change Conferences (Conferences of the Parties). Chile will hold the 25th Conference of the Parties COP25 on December 2019. In

fact, Chile is in debt: while many good intentions were announced but not realized, many dangerous toxic agents are contaminating air ("sacrifice zones") and drinking water, and several plant species are in danger of extinction. To avoid the adverse effects of global warming and its adverse effects on humankind, the Chilean Sustainable Development Council (CDS) proposed in 2008 that the following main levels of action must be met in each and every country on our planet: 1. population education, 2. zero-emission of greenhouse gases, 3. mitigation, 4. adaptation, and 5. training of new capacities [1, 4].

a) Education aims to ensure that the entire population is aware of the very serious risk of the effects of global warming and accepts the challenge of working together without exclusion, and the sacrifices involved, since it is the only way to stop the climate change. Education should be both, formal in educational establishments, as well as informal, as conferences, talks, dissemination by the press and other media, and include the political sector. Educating and population awareness of the adverse effects to be avoided are necessary for governments to accept, or be forced to accept, the necessary measures to prevent climate change.

b) Achievement of greenhouse gases zero-emission can be obtained through changes of energy generation and use towards methods not involving greenhouse gas emissions or environmental pollutants harmful to health: photovoltaic, wind and other renewable energies. Chile has a very high potential for solar energy; new methods of energy storing may allow replacement of fossil fuels with clean, carbon-free energy.

c) The main mitigation measures proposed by the Chilean CDS in 2008 [1, 4] include: (a) updating greenhouse gas emission inventories; (b) improvement of mechanisms for the protection of natural sinks and the creation of new greenhouse gas sinks (native species reforestation and arborization); (c) promotion of a National Climate Change Policy, including an Energy Efficiency Program; (d) development of territorial ordering and stability policies [1].

d) Proposals for adaptation in water, forestry, agricultural, fisheries and aquaculture sectors, regulation of urban planning instruments, and health care centers with emergency systems facing possible energy and drinking water deficits.

e) Training of new capacities, which should include institutional proposals, citizen participation, strengthening of climate and greenhouse gas records, and there should be adequate funding for research, development and Innovation. In this area, collaborative work is necessary between specialists and scientists from all professions, from health sciences, chemical, meteorological, engineering, environmental, law, social and political sciences.

In relation to health problems, the propagation prevention and treatment of tropical diseases should be emphasized. Further, although not directly related with climate change but related to massive migrations and social turbulences, the effects of prenatal and early infant exposure to agents such as polycyclic aromatic hydrocarbons, benzopyrene, dioxins and polychlorobiphenyls should be investigated, especially since this early exposure favors the development of organic diseases and neurobehavioral changes [5]. Results of recent investigations of delayed effects of early exposure to such environmental agents, together results that may be obtained in future investigations, should alert countries governments to endorse stricter standards and tighten legislation to protect future generations from diseases that may develop following prenatal or early infant exposures [6].

*Post scriptum*. In short, fewer speeches of good intentions and more action are needed: said and done, *dictum factum*.

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