

## Population Controls Environment

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### Abstract

It is confirmedly shown that global emission of CO<sub>2</sub> is determined by the world population, which is an ecological rule of the globe. It reveals that 1.3 billion is the break-even point of CO<sub>2</sub> and more people lead to net emission. The ecological system maintains a metastable state with a constant per capita emission of CO<sub>2</sub> until reaching 6.7 billion of population when the metastable state crashed. Both permafrost land and glaciers begin to melt, and the per capita emission of CO<sub>2</sub> becomes remarkably higher. The quantitative correlation clearly shows that environmental problem cannot be solved by any technical measure, but to reduce the world population. Firstly, pull the world population back to an ecologically metastable state, and then gradually to the break-even point of CO<sub>2</sub>.

**Keywords:** Population; Controls; Environment; Correlation; Ecological system.

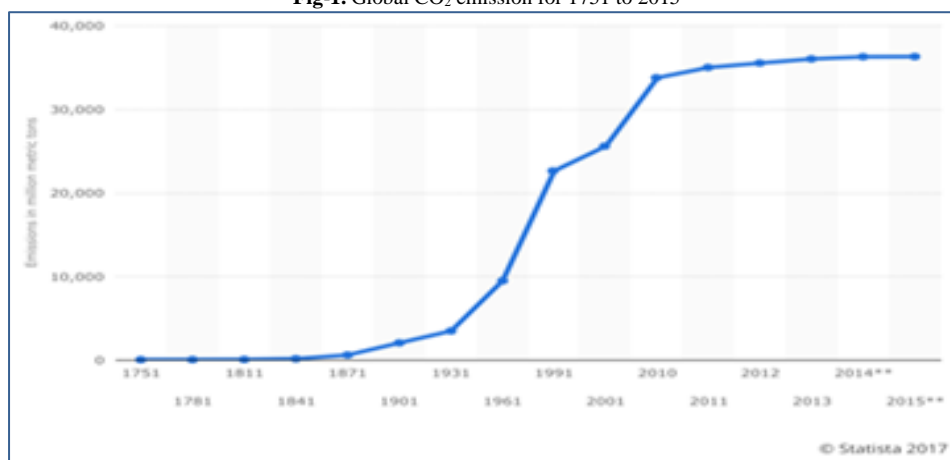


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### 1. Introduction

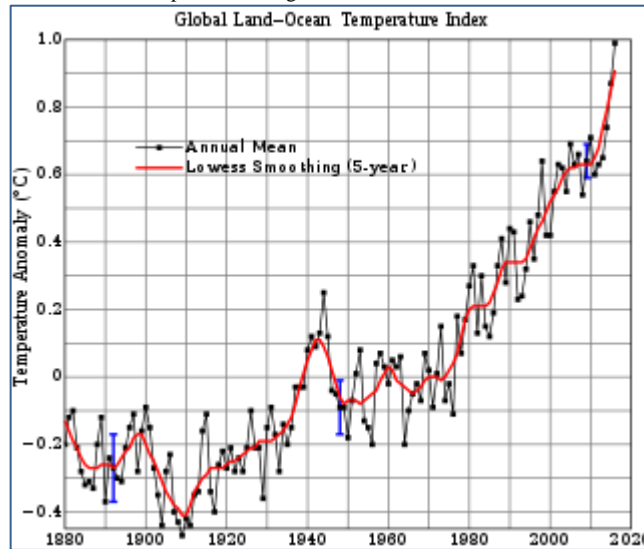
The fact of global warming has been widespread admitted, although some scholars thought it as the result of periodical changes of the globe itself and, a little ice age is claimed to come soon ([Washington's Blog and Global Research, 2012](#)). Nonetheless, emission of huge quantity CO<sub>2</sub> has been esteemed as the culprit of global warming, and a series of emission-reduction measures has been put in practice. As consequence, fossil fuels take less and less share in the world energy infrastructure, and the global emission of CO<sub>2</sub> increases quite slowly since 2010 as shown in [Fig. 1 \(Energy & Environmental Services\)](#).

**Fig-1.** Global CO<sub>2</sub> emission for 1751 to 2015



It seems the world is passing over crisis presently and global warming might stop soon. Unfortunately, NASA declares that 2016 is the hottest year since 1880, as shown in [Fig. 2 \(Global warming\)](#), and the concentration of CO<sub>2</sub> in the atmosphere reaches the highest level for the recent million years ([NASA, 2016](#)). Furthermore, the permafrost layer of the earth begins to melt since 2012, and the “gate of the hell” in Siberia and “red snow” in Canadian glaciers appeared ([Source: Meteorological enthusiast of China, 2017](#)). The former is due to eruption of methane and carbon dioxide from beneath the permafrost land surface, and the latter is due to revived red alga. Meanwhile, South Pole glaciers are reported to melt inevitably and the global average sea level will rise 4 feet ([Source Endless Explore, 2017](#)).

Fig-2. Global mean surface-temperature change from 1880 to 2016 relative to the 1951–1980 mean

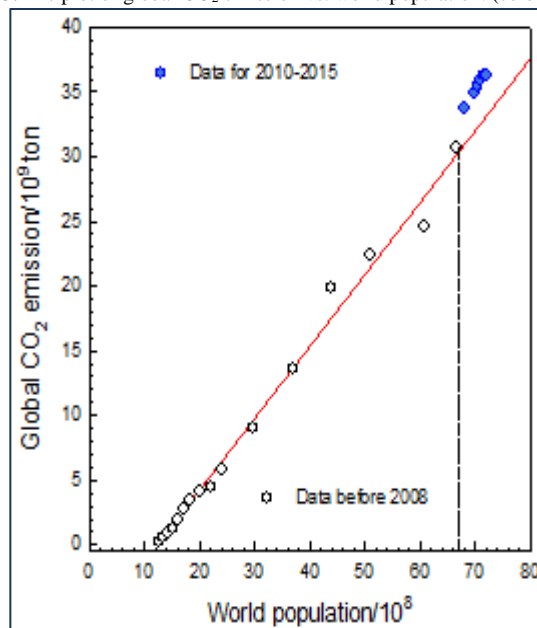


## 2. The Globe Ecological System and Its Key Nodes

It is understandable for the seemingly contradict issues if we look at the globe ecological system. A correlation between global CO<sub>2</sub> emission and the world population based on the statistics from 1850 to 2008 is shown in Fig. 3. Clearly, there isn't CO<sub>2</sub> emission when the world population is no more than 1.3 billion; however, more people lead to net emission of CO<sub>2</sub> and the emission quantity increases linearly with the growth of population. Therefore, 1.3 billion of population is the break-even point of CO<sub>2</sub> for the globe ecological system. No room left for suspicion since the correlation coefficient is as high as 0.99. The recent data of emission and population for 2010 to 2015 are shown also on the plot with blue dots in Fig. 3. Unexpected, the recent data do not locate beneath the linear correlation, but above it instead. It means the per capita emission of CO<sub>2</sub> is remarkably higher than previous. Why is that? Are these emission-reduction measures made in vain?

Mathematically, it is because the growth rate of world population is less than that of global emission, and this is true. The growth rate of world population shows a descend trend recently. For example, it reduces from 1.16 % at 2010 to 1.11 % at present; however, CO<sub>2</sub> emission is still an increasing function of time, though the increasing rate is considerably down. Ecologically, the globe ecological system assumes a metastable state when the world population crosses over the break-even point of CO<sub>2</sub> until population reaches 6.7 billion at 2008, after which the linear relation ends up due to higher per capita emission of CO<sub>2</sub>. Then the permafrost land begins to melt and huge quantity of CH<sub>4</sub> and CO<sub>2</sub> emits into atmosphere from beneath land surface. Therefore, 6.7 billion of population is another key node of the globe ecological system that marks the end of the metastable state.

Fig-3. The plot of global CO<sub>2</sub> emission vs. world population. (color print)



### 3. Severity of Melting Permafrost Land and Glaciers

The area of permafrost land is  $5.9 \times 10^6$  km<sup>2</sup> and occupies 5.5 % of the total earth land. A huge quantity of greenhouse gases will emit into atmosphere if the permafrost land continues to melt. Beside deterioration of global warming, virus and bacteria that deeply buried in will expose to the air and revive either. In the summer 2016, a boy of 12 years old living in Yamal Peninsula inside the Arctic Circle died for anthrax, and at least 20 more people had to be hospitalized. They were infected by a disclosed reindeer that died for anthrax long time ago and buried in permafrost. Collectotrichum carried on the reindeer corpse revived due to earth warming. Another consequence of melting permafrost land is the contraction or even disappearance of glaciers. For example, Tibet-Plateau warms up most fast, and the Glacier Himalaya shrinks back at a speed of 33 to 49 ft per year. However, this glacier is the origin of Ganges River, Yangtze River, Yellow River, Mekong River, etc. The short effect of glacier melting allows for rivers/lakes of increasing water volume. For example, the area of Qinghai Lake continuously expands in recent years. However, drying up is the last result as glaciers being less and less. The Pine Island Glacier and Thwaites Glacier in the South Pole are recently reported to inevitably melt and the global average sea level will rise for 4 feet. One must pay attention to the fact that population increases exponentially. Present world population is 7.5 billion with a growth rate of 1.11 %. It will be doubled in 65 years provided the growth rate keeps unchanged. Perhaps all permafrost land and South Pole glaciers melt within 65 years, and anybody can conceive the consequence. Therefore, environment is facing crisis and the environmental crisis is actually the living crisis of humanity.

It is clear that the environmental problem cannot be solved by any technical measures. A World Fertility Agreement rather than climate agreement is urgently needed. The radical measure to thoroughly eliminate environmental crisis is to reduce world population immediately. It is very tough to reach the goal, and perhaps no one politician would like to appeal his people to face the fact and do that as expected. Now the world steps to a crux: to survive or to disappear. Many countries and a lot of people are suffering from terrorism. However, terrorists kill few people, but fast global warming may allow all people for no way to live. Just consider that the world population will be 15 billion in only 50-60 years if we keep the living style as before.

### 4. Conclusion

The fast elevation of global mean surface-temperature since 2010 and the concomitant consequences, such as melting permafrost land and glaciers, as well as the ever frequent abnormal climate, are due to crash of metastable state for the globe ecological system. The urgent task of the world is to sharply reduce world population. Firstly reduce the world population to less than 6.7 billion in order to resort to a metastable state, and finally to 1.3 billion to maintain ecological equilibrium of CO<sub>2</sub> for the globe.

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