

Climate Change and Life

Somchai Bovornkitti*

**Greenhouse phenomenon → Global warming →
Climate change → Extreme weather → Threats
to life**

The term “global warming” had been dominant for almost a century; however, several new terms have recently come into popular use, especially “climate change,” which strongly confronts the long-time preference.⁽¹⁾ Although the literal meanings of the two terms have been loosely interchangeable, in common usage “global warming” refers to the increase in the average temperature of the Earth’s near-surface environment in recent decades and its projected continuation as a result of increasing levels of greenhouse gases caused by human activity. As the levels of greenhouse gases in the atmosphere increase, so does the infrared radiation being reflected from the Earth’s surface. Because heat is being trapped within the atmosphere, the planet loses less heat over time and the Earth experiences greater warmth and its attendant global consequences.

This communication employs the term “climate change” in the sense of weather instability, which

prevails as a result of the so-called greenhouse phenomenon concurrently with or induced by the increasing global surface temperature. Warmer environmental temperatures and climate-induced changes predictably threaten life, both directly and indirectly, and the effects may be immediate or gradual, as elaborated below.

There is little doubt that increases in global temperatures can cause many environmental changes, including sea level rise, changes in the amount and pattern of precipitation, the frequency and intensity of extreme weather events, agricultural yields, the retreat/disappearance of glaciers, reduced summer stream flows, potential species extinction, increases in the range of disease vectors, and detrimental impacts on human health.^(2,3)

Heat waves, floods, storms, and drought can cause death and injury, famine, the displacement of populations, disease outbreaks, and psychological disorders. Regional food production is likely to decline because of increased temperatures, which accelerate grain sterility. Shifts in rainfall patterns would render previously productive land unfertile, thus ac-

*The Academy of Science, the Royal Institute, Bangkok 10300

celerating erosion, desertification, and reducing crop and livestock yields. Rising sea levels would make coastal land unusable and cause fish species to migrate. There would also be an increase in the frequency of extreme weather events, which would further disrupt agriculture.⁽⁴⁾ Local declines in food production would lead to more malnutrition and hunger, and produce long-term health consequences. Moreover, as the Earth gets warmer, heat waves and water shortages would make it difficult to access safe drinking water and sanitation. Declining precipitation in water catchments is already creating competition between stakeholders over the appropriate use and sharing of remaining water resources, as described from time to time in the news.

Higher temperatures may alter the geographical distribution of species that transmit disease. In a warmer world, mosquitoes, ticks, and rodents could expand their range to higher latitudes and higher altitudes. The seasonal transmission and distribution of many diseases that are transmitted by mosquitoes (malaria, dengue, yellow fever) and by ticks (Lyme disease, hantavirus pulmonary syndrome, tick-borne encephalitis) may be accentuated by climate change. In addition, climate-induced changes in the formation and persistence of pollens, spores, and certain pollutants could promote the occurrence of asthma,

allergic disorders, and cardio-respiratory diseases. Warmer seas could influence the spread of disease, i.e., a correlation between cholera cases and sea surface temperature, an association between El Niño and epidemics of malaria and dengue, enhanced production of aquatic pathogens and biotoxins jeopardizing the safety of seafood, and the increasing occurrence of toxic algal blooms.

Lastly, in the context of genetics, scattered studies have reported the phenomenon of "temperature-dependent sex determination, showing altered proportions of newborn sexes of animals⁽⁵⁾ and humans⁽⁶⁾ in accord with environmental temperatures.

Key words: *climate change, life*

References

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