

Abstract

Global warming is driving a steady increase in energy demand due to intensified seasonal temperature extremes. Fossil fuel use remains the main contributor, while clean energy sources face limitations in meeting growing needs. This paper highlights “precipitation enhancement plans” as a nature-based solution to address rising energy and water demand, projected to grow by at least 10% annually. These strategies help restore atmospheric balance through increased humidity and temperature regulation. Green spaces also play a key role by preserving surface moisture and reducing greenhouse gases. Integrating these ecological solutions is essential for sustainable climate management and long-term human survival.

Keywords: Climate change, global warming, energy demand, precipitation enhancement, green spaces, clean energy,

State the problem

Climate change and global warming are projected to escalate global energy demand. The reduction in atmospheric humidity intensifies winter cold spells while exacerbating summer heatwaves, leading to heightened energy consumption. Consequently, overall energy demand is expected to rise significantly, with an estimated annual increase of at least 10% on average.

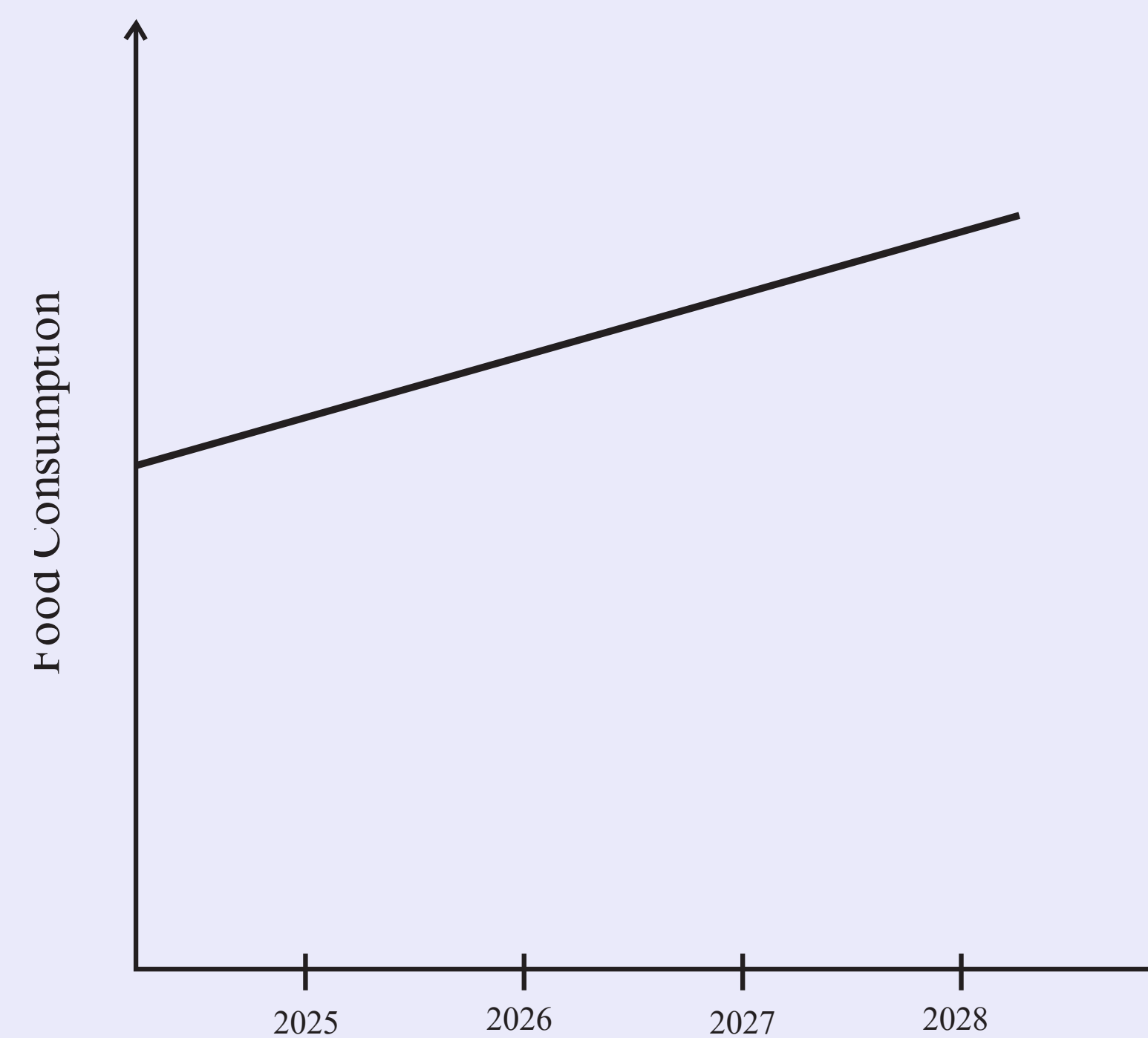
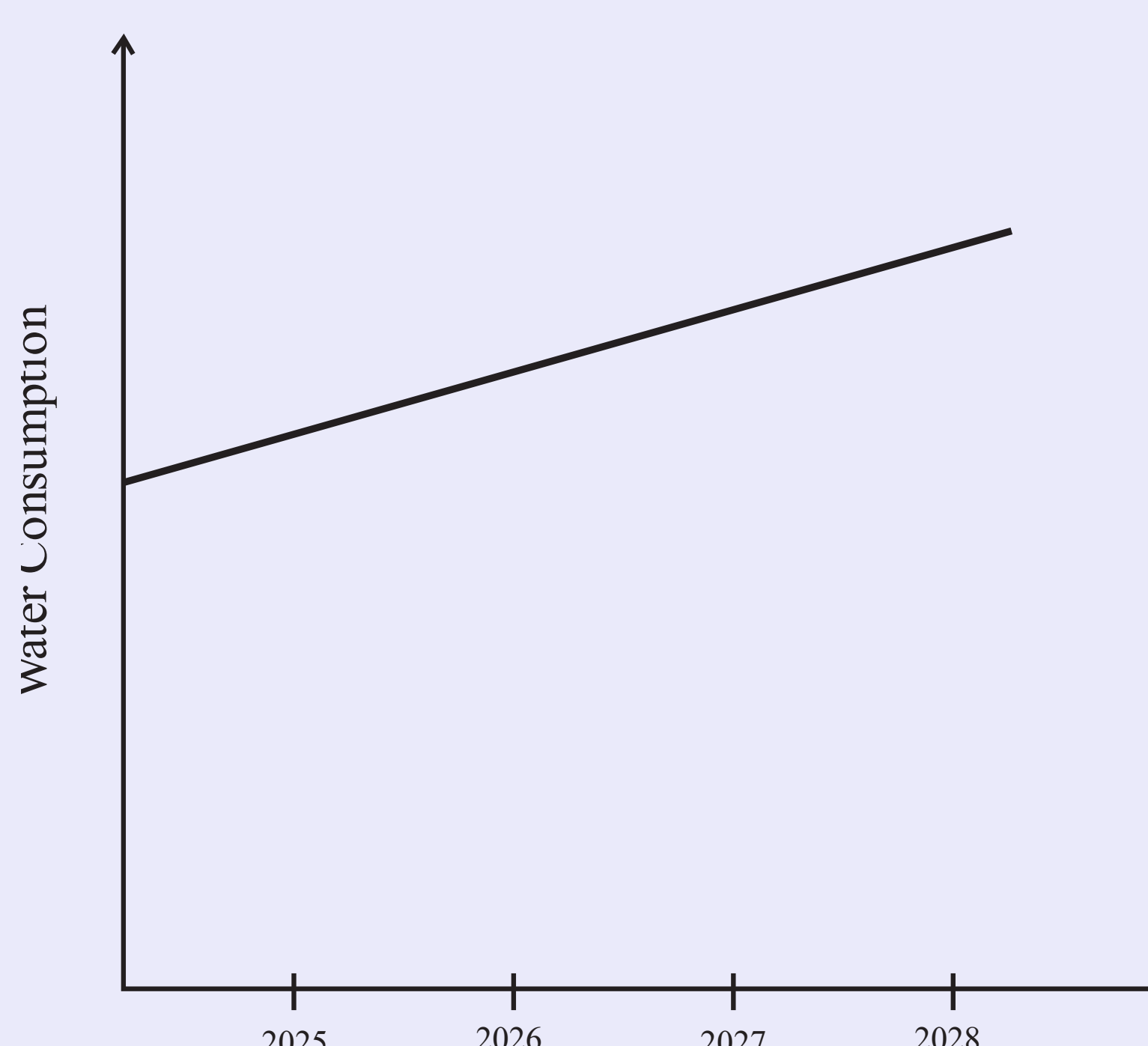
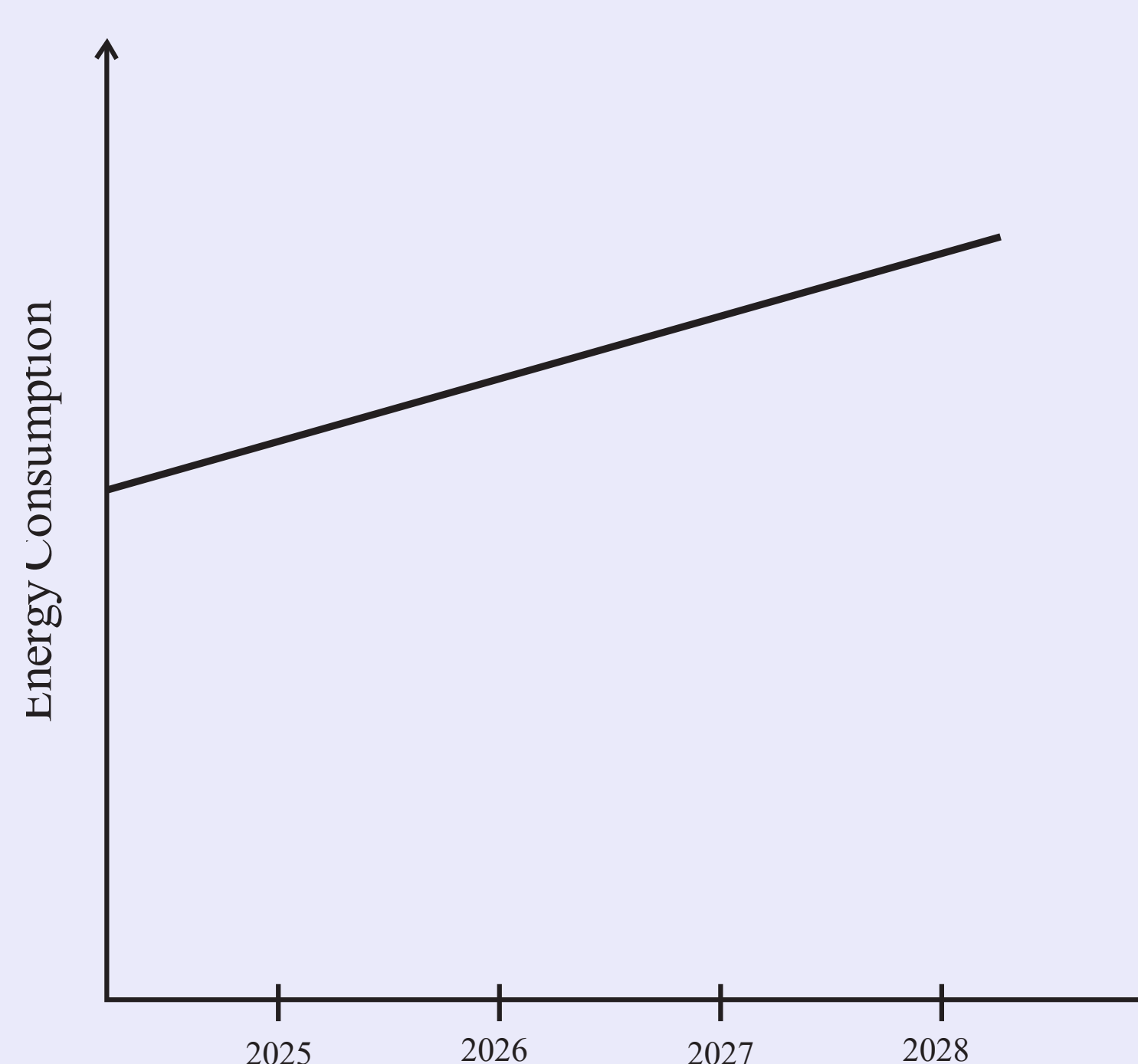


Fig. 1. Increase in demand for energy and freshwater resources, along with the rise in global temperature.

Recommended Solutions

The consumption of fossil fuels and the resulting greenhouse gas emissions have been primary drivers of global warming. Likewise, a further increase in fossil fuel usage will intensify this phenomenon, exacerbating the rate of global temperature rise.

The transition to clean energy sources, such as nuclear and solar power, presents certain challenges. The expansion of nuclear energy remains constrained by political and security concerns, the requirement for advanced technological infrastructure, and the prolonged timeline for the construction and operationalization of nuclear power plants, limiting its capacity to meet current global energy demands. Similarly, solar energy faces limitations in addressing the continuously rising energy consumption due to its dependency on seasonal variations and generation rates, which may not align with demand fluctuations in human society.

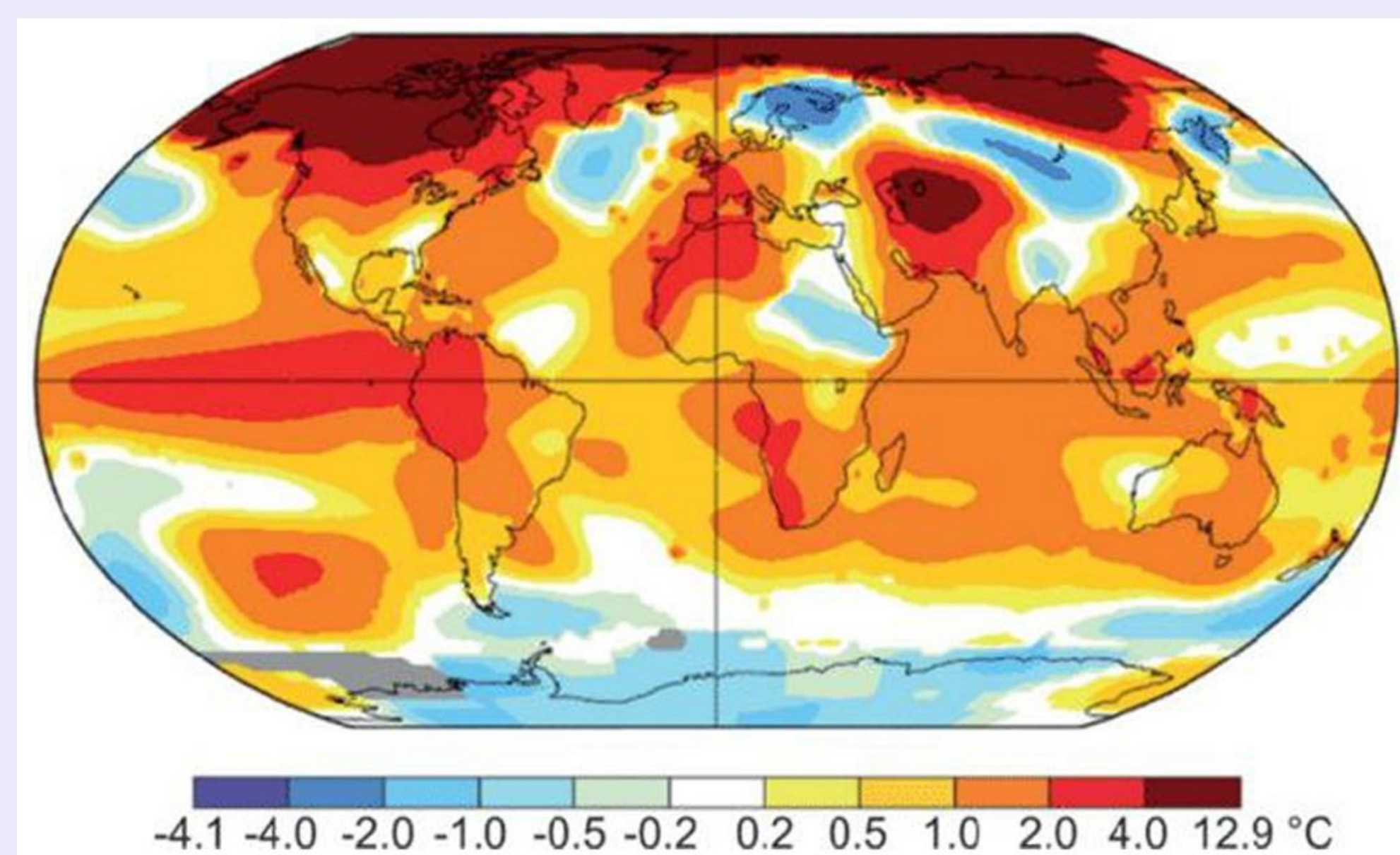


Fig. 2. Atmospheric temperature anomalies [°C] for January 2016 compared to the temperature record since 1880.

Given the current trajectory of global warming, a sustained increase in the Earth’s average temperature by 2 to 3°C could have severe consequences. If this warming trend continues and the global average temperature approaches 60°C, the conditions for human survival on the planet may become unviable.

“Precipitation enhancement plans” have been proposed as a strategic approach to mitigate global warming, restore environmental balance, and address the growing demand for water and energy, which is projected to increase by 10%. These initiatives aim to support sustainable resource management through two key strategies: (1) general precipitation enhancement and (2) localized precipitation enhancement.

Conclusion

Green spaces play a crucial role in mitigating the effects of climate change through two primary mechanisms: (1) by preserving surface-level humidity, they help regulate ambient temperatures, thereby preventing extreme fluctuations in the Earth’s surface temperature; and (2) by enhancing oxygen production, green spaces contribute to the reduction of greenhouse gas concentrations and support the restoration of the ozone layer in the Earth’s atmosphere.

"Precipitation enhancement plans", as nature-based solutions, represent one of the most significant human innovations in terms of their potential impact on human life.

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