



# Unearthing the human dimension of climate change: The reflections of an analytical environmental chemist

By Cecilia Ojemaye

Cecilia Ojemaye is a postdoctoral research fellow based at Environmental Humanities South (EHS) at the University of Cape Town (UCT). Her transdisciplinary research, which cuts across the natural sciences, humanities and social sciences, focuses on the contamination of water, the risk this poses to people and the environment, and how this has been exacerbated by climate change. She obtained her BSc in chemistry from the University of Ilorin, Nigeria and has a PhD from the University of the Western Cape (UWC).

*The pressing issues of climate change and environmental contamination are inextricably linked to social science and humanities, writes CECILIA OJEMAYE. She explains how at first this was a world she found herself lost in, but at the same time intrigued by the way scholars in these disciplines think and try to connect different issues. It is through these interactions that she gained a better understanding of the human dimension of these crises. »*



Environmental contamination, at its core, is a consequence of human activity. It involves spreading pollutants into our air, water and soil, disrupting ecosystems and posing a risk to human health. My role as an analytical environmental chemist is to identify and understand the chemical fingerprints left by these pollutants, enabling us to trace their origins and impacts. Yet, this scientific pursuit is merely the first step in understanding the broader effect of environmental contamination.

Some of the analytical tools used in this field can elucidate the presence of contaminants such as heavy metals, pesticides, pharmaceuticals and industrial chemicals, but it is the social sciences and humanities that explain the intertwined narratives of environmental injustice, policy failures and human suffering. Environmental contamination often affects marginalised communities to a greater degree, increasing existing disparities in health and socioeconomic well-being.

Climate change is another urgent global challenge, one which presents an even more complex connection between analytical environmental chemistry and the social sciences. The science of climate change relies on analytical chemistry techniques to quantify greenhouse gas emissions, track temperature changes and monitor ocean acidification. This data is crucial for understanding the physical processes driving climate change and informing policy decisions. Yet, the significance of climate change goes beyond the boundaries of chemistry. It is a typical example of a scientific issue that demands interdisciplinary collaboration.

The social sciences and humanities play a vital role in driving the complex terrain of climate change adaptation, mitigation and justice. Climate change is not merely a matter of physical parameters but a profoundly human issue, with far-reaching implications for society and culture.

One crucial aspect of this intersection is climate change communication. As analytical environmental chemists, we can generate precise data on greenhouse gas concentrations — carbon dioxide ( $\text{CO}_2$ ), methane ( $\text{CH}_4$ ) and nitrous oxide ( $\text{N}_2\text{O}$ ) — interpret this data and determine their effects on/risk to the environment and humans. In addition, analytical



environmental chemists translate this information into messages that resonate with the public and policymakers. However, effective climate communication involves understanding the psychological, cultural and social barriers that hinder action on climate change which analytical environmental chemists along with social scientists and communicators can complementarily address.

One of the most notable intersections of analytical environmental chemistry and the social sciences is the examination of the environmental injustices associated with climate change. Vulnerable communities often with low-income and minority populations bear a disproportionate burden of the environmental and health impacts caused by climate change and pollution. These communities are more likely to live near polluting industries and experience the adverse effects of environmental contamination.

The field of environmental psychology, for instance, explores how individuals perceive and respond to environmental risks and climate-related information. It investigates the factors that influence people's attitudes and behaviours toward these issues, providing insights into strategies for promoting them. The success of climate policies often hinges on the ability to engage diverse communities and overcome resistance to change.

My work as an analytical environmental chemist has taught me that addressing environmental contamination as well as climate change requires a multidisciplinary approach. The complexity of these challenges demands collaboration between scientists, social scientists and humanities scholars. We must collectively confront the environmental injustices, ethical problems and human consequences of our actions.

However, bridging the gap between these disciplines is not without its challenges. Each field has its own methods, language and priorities. Effective interdisciplinary collaboration requires open dialogue, mutual respect and a shared commitment to finding solutions to our shared problems.

In my journey as an analytical environmental chemist, I have come to appreciate the profound importance of communication. We must convey the implications of our scientific findings to policymakers, the public and fellow scientists in a way that resonates with their values and concerns. The social sciences and humanities provide invaluable insights into how to craft messages that inspire action and promote environmental stewardship.

In conclusion, as an analytical environmental chemist, I have been exposed to the intricate interplay between scientific inquiry and the human dimension of environmental contamination and climate change. While my laboratory work is grounded in precise measurements and data analysis, I am acutely aware of the profound human implications of my research. The social sciences and humanities enrich our understanding of these crises, offering insights into the social, psychological, economic and ethical dimensions that underlie them. As scientists, we must embrace interdisciplinary collaboration and engage with researchers from diverse fields to develop comprehensive solutions that address the complex challenges of our time. By doing so, we can work toward a more sustainable future that respects the environment and upholds the dignity and well-being of all people. **NA**