



Editorial



MAHMUD FAROOOUE School for the Future of Innovation in Society, College of Global Futures and Consortium for Science, Policy and Outcomes, Arizona State University, USA

(Mahmud.Farooque@asu.edu)

easured either in terms of reported deaths or excess mortality, the loss of lives worldwide associated with COVID-19 was higher in 2021 when multiple effective vaccines became available than in 2020. The task of getting people vaccinated proved to be more daunting than the task of developing vaccines, in a record time. The global tragedy, burden of which was shared disproportionately by the historically vulnerable and marginalized, should be a wake-up call for policy and decision-makers about the danger of focusing primarily on the technical side of what are essentially complex sociotechnical problems with differentiated global and local challenges.

A similar pattern of response is emerging as countries unite to drastically reduce or eliminate their dependence on Russian energy supply in the wake of its war of choice with Ukraine. Understandably, the immediate focus has been to maintain the status quo by switching to alternate sources and more efficient means of energy production and distribution. However, this only addresses the supply side of the problem, arguably the low hanging fruit, not the demand side, which also must be addressed in order to make advance towards the targets of the Paris Climate Agreement and meet the UN Sustainable Development Goals.

While far from being perfect, the concept of "energy sufficiency" offers an alternate framing of the challenge, which recognizes two objectives that need to be simultaneously addressed: maintaining an upper environmental ceiling determined by planetary boundaries (e.g., atmospheric carbon, biodiversity, air pollution and materials) and a minimum social development threshold based on basic human needs (e.g., health, shelter, mobility, communications, work and freedom).

Meeting these dual objectives will not be easy. The long running debates about whether wants can be separated from needs, whether social consensus can be reached at the global and local levels, and whether the process of generating such consensus with experts and the lay public can be operationalized to provide timely input to policy and decision-making, are some of the questions that hang in the balance. Answering these sociotechnical questions will require integration of knowledge not only of many different disciplines and traditions but also of lived experiences, cultures and values. These expositions fit squarely in the domain of transdisciplinary knowledge co-production, technology assessment and public participation with strong justice and equity considerations, the subject of this issue's special topic.

Mahmud Farooque



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