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Editorial: Insights in climate and economics: 2021

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Editorial on the Research Topic
Insights in climate and economics: 2021

The special issue "*Insights in Climate and Economics*" sheds new light on the importance of economics and decisions making in the context of climate change. While climate is the weather conditions prevailing in a specific region over a long period, economics defines the knowledge concerning production, consumption, and transfer of wealth (Oxford English Dictionary, 2023). However, climate change affects economic decisions as it impacts economic activities.

Measuring the damages from climate change is one of the challenges discussed in this issue. "*Challenges and Opportunities in Climate Economics*" discuss the challenges and opportunities in designing policy to mitigate greenhouse gases (GHG) while focusing on CO_2 (Yoo et al.). Although GHG emissions threaten human civilizations, affecting each one, the GHG impacts are skewed toward low-income countries that contribute the least to climate change (Tol, 2014; Partridge et al., 2017). Essential, however, is the measurement of the effect of climate change on economic activity.

To this end, the "*Misapplication of conventional economic analysis to climate change from the post-normal science perspective: The "social cost of carbon" myth*" critically reflects on one of the vital parameters needed to develop sound policy and combat climate change effectively and efficiently (Mayumi and Renner). Those authors argued that the applications of cost-benefit analysis to climate change and the monetary calculation of the social cost of carbon fall short. First, the authors argue that cost-benefit analysis does not adequately address avoidance or mitigation of pervasive and irreversible climate change issues and is ill-equipped to deal with the profound uncertainty surrounding climate change. Then, the authors argue that climate change is beyond the scope of scarcity, discounting, and substitution and, thus, beyond cost-benefit analysis and the social cost of carbon approaches. The authors propose an alternative post-normal science approach that centers around the deep uncertainty and its effect on the various aspects of climate change. The authors recommend replacing the definite solution or technological implementation with a heuristic approach while modifying decisions over time to the many elements of uncertainty as we better understand it. To the authors understanding, this approach is necessary for offering constructive solutions that bridge disagreement among the various stakeholders. The paper goes beyond real option value, which tries to model investment under uncertainty, and provides a heuristic approach that introduces learning into the decision process.

Another topic covered in the current issue pertains to natural resources and their management. The effect of climate change on resources requires climate economics to offer solutions and prescriptions that address this mounting challenge. *"Towards a Nature-Based Economy"* discusses some of these concerns (Chami et al.). In that paper, the authors point to the double challenge of climate change and biodiversity loss, where economic activities lead to growth at the expense of nature. To try and mitigate the ramifications of human actions, the authors propose to create a nature-based economy that may minimize the negative effect humans have on climate and biodiversity, thus yielding sustained solutions and shared prosperity of humans and nature. The fundamental idea is the development of supply chains and markets around the protection and regeneration of nature. By using policies and actions to develop a nature-based economy and building around conservation as a source of capital for development, the authors argue that it will lead to sustainable use of resources and innovation of markets that support a nature-based economic growth outcome. However, will it also lead to enough food to feed world population?

As noted in "*Challenges and Opportunities in Climate Economics*," climate economics requires global and interdisciplinary efforts (Yoo et al.). Then, *"Towards a Nature-Based Economy"* suggested developing these efforts around conservation (Chami et al.). Climate change includes technology (Karakosta et al., 2010; Gans, 2012), health (Deschênes et al., 2009; Jones, 2019; Barreca and Schaller, 2020), wellbeing (Kelly and Adger, 2000; Barnett, 2003; Pecl et al., 2017), and energy (Karl and Trenberth, 2003; Davis et al., 2010; Spence et al., 2011) challenges. To my understanding, the foundation of any climate solution centers around technological innovations, and thus the importance of understanding innovation supply chains is essential and should guide policy (Zilberman et al., 2022). Support for research and development is crucial for us to find a solution that supports biodiversity while mitigating climate change, solutions developed through interdisciplinary research and knowledge.

Different from the *"Misapplication of conventional economic analysis to climate change from the post-normal science perspective: The "social cost of carbon" myth"*, "*Challenges and Opportunities in Climate Economics*" identify estimating the social cost of carbon and the measurement of intangible assets as essential (Mayumi and Renner; Yoo et al.). In addition, "*Challenges and Opportunities in Climate Economics*" argue that the social costs of carbon need methodological improvements and should be updated over time while reaching an international consensus on the social cost of carbon (Yoo et al.). About the damages from climate change via physical, human, and natural stocks, the paper also suggests accounting for the intangible damages. Climate economists should explore alternative ways to measure critical non-market outcomes.

Climate economics, however, does not end with the social cost of carbon and natural capital. Climate economics encompasses other essential topics related to human behavior and decision-making. For example, in *"How much difference does household energy source selection make in winter CO_2 emissions?"* the authors strive better to understand households and their response to the policy (Matsumoto). The paper presumes that households use energy sources for many purposes. The authors then estimate households' energy source selection during the winter using 29,887 homes randomly selected throughout Japan. While using a selection bias correction model, their analysis reveals that households use alternative energy sources as temperature decreases. The study also shows that families primarily using electricity and kerosene yield more CO_2 emissions than households that use natural gas.

Climate change poses many challenges that require a better behavioral understanding, from individual adoption decisions to the global community's support for the transition to net-zero emissions. Topics touched upon in the current special issue.

Author contributions

GH synthesized the various papers while identifying a common theme and wrote the editorial.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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