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Earth's Future

COMMENTARY

10.1029/2022EF002857

Key Points:

- Two recent surveys show that business experts and scientists perceive risks associated with climate change to be paramount
- Experts are especially concerned that irreversible/catastrophic climate outcomes will soon become locked in
- High perceptions of climate risk remain despite the ongoing threat of COVID-19

Supporting Information:

Supporting Information may be found in the online version of this article.

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Climate Action Failure Highlighted as Leading Global Risk by Both Scientists and Business Leaders

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Abstract Despite the increased salience of infectious disease risk due to the COVID-19 pandemic, two recent surveys of the business and scientific communities have found a continued belief in the prominence of environmental risks. In particular, failure to take action on climate change was seen as a highly likely risk whose impacts would become locked-in barring an immediate global response. These expert opinions are consistent with a growing body of evidence and give us insight into the priorities of global thought leaders who study and respond to risk. Given this alignment in priorities, we argue for the importance of integrating climate and environmental action into responses to emerging threats.

Plain Language Summary In this Commentary we share results from a global risks perceptions survey of a community of scientists and compare findings with a similar survey focusing on the business community. We find that the many global impacts of the COVID-19 pandemic raised risk perceptions of infectious diseases, but both the surveyed business and scientific communities continue to view preventing environmental risks as a major priority. Climate action failure was especially seen as a very likely risk that could put the global community on a path toward irreversible outcomes that become more severe beyond the short-term. We suggest that where possible, nations, communities, and businesses should seek to incorporate climate action into their responses to emerging threats.

1. Introduction

In a time when governments, businesses and scientists focused their efforts on the COVID-19 pandemic, various other policy initiatives and research agendas were deprioritized, including climate change mitigation (Agaba, 2020; Else, 2020; Rabson, 2020). The rising concern of infectious disease risk was clearly expressed in two recent, complementary surveys of distinct expert groups. The first, the Global Risk Perception Survey conducted by the World Economic Forum (WEF), which is an annual survey of corporate, government and non-governmental organization leaders, with expertise concentrated in business and economics (WEF, 2021). The second, the Global Risks Scientists' Perceptions (GRSP) survey conducted by Future Earth and the International Science Council, assessed the perceptions of risk of members of the scientific community worldwide, especially experts in environmental sciences (Future Earth, 2021). Posing identical questions to evaluate the perceived likelihood and potential impact of 35 global risks over the coming decade, both surveys found that experts' ranking of the perceived risk of infectious diseases increased compared to surveys conducted in previous years (Future Earth, 2020; WEF, 2020). Yet, both groups of experts anticipate that environmental risks would dominate the risk landscape in coming years. Failure to take action on climate change especially was seen as a highly likely and consequential risk, and one whose cascading impacts across other risk dimensions could become locked-in if necessary action is not taken in the coming decade. Comparing results from our GRSP survey with those from the WEF, we find that there is strong alignment between these two communities on the risk posed by failure to take

Methodology: Seth Wynes, Jennifer Garard, Paola Fajardo, Midori Aoyagi, Melody Burkins, Kalpana Chaudhari, Terrence Forrester, Matthias Garschagen, Paul Hudson, Maria Ivanova, Edward Maibach, Anne-Sophie Stevance, Sylvia Wood, Damon Matthews
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action on climate change. We argue that while often portrayed as having opposing positions on climate change, these two global communities share common perception of the risk landscape, though they do not express a shared urgency for this risk, a key requisite for facilitating collective action (Garschagen et al., 2020).

2. Despite the Pandemic, Environmental Risks Are Still the Leading Cause for Concern Among Experts

Consistent with findings from previous years, environmental risks like climate action failure, biodiversity loss and extreme weather events were perceived to be among the most likely and consequential risks according to global experts (Figure 1). This was true both for the GRSP sample and the WEF sample. See also Di Baldassarre et al. (2021) and Mondino et al. (2020) for discussion of similar findings among members of the public.

Considering the unique circumstances generated by the pandemic, we recognized the importance of measuring changes in peoples' overall perception of risk from previous years. We therefore asked GRSP survey respondents how their perspective of overall systemic risk had changed over the past year on a five-point Likert scale from greatly decreased to greatly increased. The results show that 84% of respondents believed risks had either increased or greatly increased. We then asked respondents to list factors influencing this change in perception; 17% of the factors listed by respondents referred to the pandemic, while 24% referred to environmental hazards, with climate change dominating this list. Mentioned factors included both observations of greater climate impacts (e.g., in respondents' own words, "Increasing evidence of extreme weather events linked to climate change") along with failures to address the climate crisis ("Slow progress in globally coordinated climate action").

While the risk of climate action failure was ranked by surveyed scientists as a major risk for the coming decade, even greater concern for climate change inaction was voiced when considering impacts over a longer timeframe. Respondents were asked to describe the *"risks that we could commit to and/or cross a threshold toward within the next 10 years that could put us on a path toward irreversible or catastrophic outcomes that manifest after the 10-year time span"*. Responses to this open-ended question were coded independently by three researchers who consolidated coding categories and recoded the responses according to Qualitative Content Analysis methodology (Schreier, 2012). Climate action failure was the most frequent response, mentioned more than three times as often as the next leading response: "Biodiversity loss" (Figure 2). Climate action failure was also viewed as the leading risk which we could commit to in the next 10 years in the survey of the WEF community (WEF, 2021). Taken together, these responses suggest a significant and shared concern for environmental hazards, and in particular climate inaction, across both scientific and business and economic communities, uninterrupted by a global pandemic.

3. The Value of Thought-Leader and Expert Perceptions to Chart a Path Through Global Risks

Any discussion of anticipating future risk should start from a shared understanding that, even for experts, forecasting is difficult and prone to error (Morgan, 2014; Tetlock, 2017). Still surveying experts can serve more than one purpose. First, it is useful insofar as the experts themselves are also key-decision makers and actors. Since the business and economic communities surveyed by WEF and the high-ranking scientists targeted by the GRSP survey play an important role in guiding investments and research agendas, their perceptions of global risks serve as a signpost for changing priorities. As an example, businesses that perceive themselves to be more highly exposed to natural hazards increase their investment in adaptive behavior (Chinh et al., 2016; Neise & Diez, 2018) and experiencing a disaster event is also a major driver of action (Herbane, 2015; Jehmlich et al., 2020; Kato & Charoenrat, 2018; Kuhlicke et al., 2020). In the scientific community, research in 2020 and 2021 was dominated by COVID-19 with 20% of citations attributed to COVID-19-related papers and 98 of the 100 most-cited papers related to the pandemic (Ioannidis et al., 2022). In light of the historical tendencies of businesses to invest in preventing risks they perceive as most likely, and the huge reprioritization of the scientific community in response to the pandemic, the continued focus by these communities on environmental risks is of great import.

Given the agreement between scientific and business experts that climate change poses such a unique threat, what explains the inadequate global response? A deep literature points to broad causes of inaction. Institutional, political and structural inertia each pose significant barriers to reducing greenhouse gas emissions quickly enough to achieve international targets (Matthews & Wynes, 2022; Mitchell et al., 2018; Seto et al., 2016; Tong

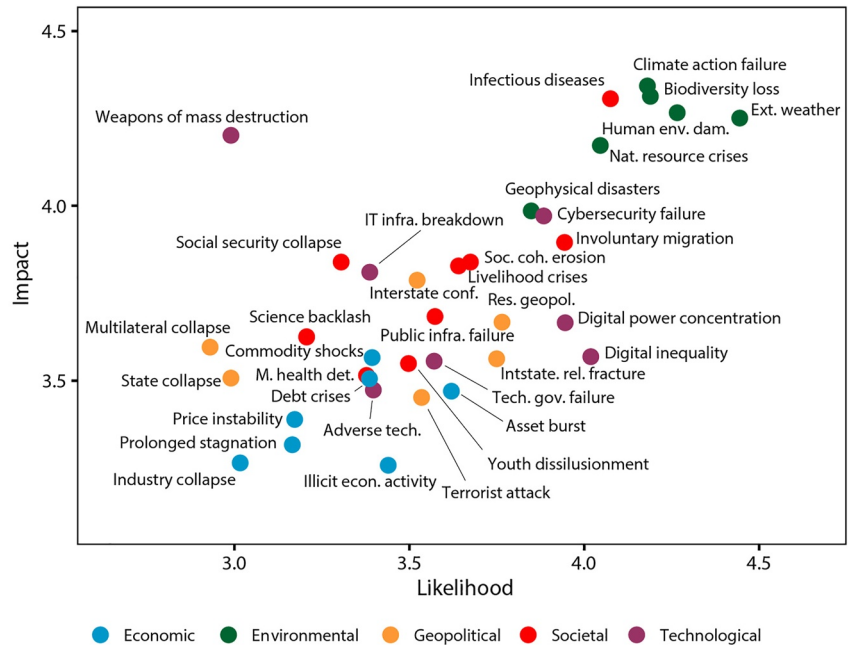


Figure 1. Perceptions of likelihood and impact of 35 global risks evaluated by Global Risks Scientists' Perceptions survey respondents over the next 10 years as rated on a 5-point Likert scale with wording and scale adopted from WEF (2021). Point color represents the category of risks.

et al., 2019; Welsby et al., 2021). Likewise, while many business leaders may view climate inaction as a threat, a number of corporations with vested interest in the continued use of fossil fuels have actively lobbied against action (Brulle, 2021; Culhane et al., 2021). Action from governments is also downstream of public support (Baumgartner & Jones, 2010), but the public has not been particularly responsive to new shifts in temperature (Moore et al., 2019) or to climate disasters (Ogunbode et al., 2019). The sum of these obstacles and others, has led to the insufficient efforts at climate action that characterize the current global response.

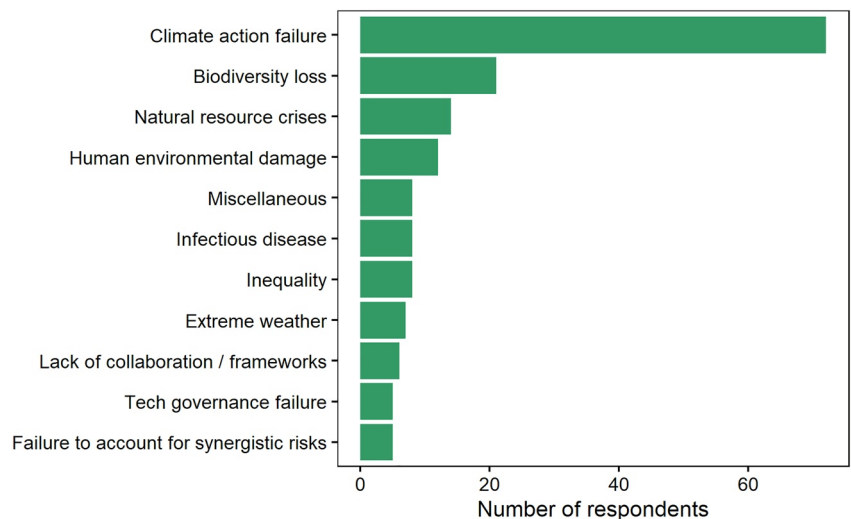


Figure 2. The 11 most frequently cited risks which “could put us on a path toward irreversible or catastrophic outcomes that manifest after the 10-year timespan” as rated by respondents in the Global Risks Scientists' Perceptions survey.

4. Interconnected Nature of Risks

Though the results from these surveys indicate high levels of concern regarding the risks of climate inaction, we would stress that respondents did not view this as a unidimensional risk. Instead, respondents identified five risks as being highly connected: climate action failure, biodiversity loss, infectious disease, extreme weather events, and human environmental damage.

Furthermore, when asked to identify additional risks which were not included in the proposed 35, several respondents went so far as to identify the failure to plan for multiple, synergistic risks as its own category. For example, climate action failure will increase the likelihood of extreme weather and climatic events such as stronger hurricanes, wildfires, as well as droughts and heatwaves. Moreover, more frequent and severe storms, fires and droughts can accelerate/intensify forest and biodiversity loss, fragmentation, and degradation creating ecological regime shifts that augment the risks of extensive forest dieback (IPBES, 2019; IPCC, 2022). This reinforces the need to prevent tipping points that could lead to ecosystem collapse and irreversible consequences for biodiversity and human well-being.

The COVID-19 pandemic should act as a reminder of the way that risks can overlap and compound. For instance, biodiversity loss and human environmental degradation can lead to increased zoonotic disease transmission (Keesing & Ostfeld, 2021) and those subsequent diseases can lead to shocks to the global economic and social systems.

Our respondents are not alone in seeing the interconnected nature of environmental risks in a globalized world. Experts have identified the importance of stressing these concepts in research and policy (Liu et al., 2015). We would also point to efforts taken to communicate the cause-and-effect relationships between climate and other sectors (Yokohata et al., 2019). This is particularly important as the tipping points in environmental impacts can be considered as a type of systematic risk emanating from the complexity of how different sectors interact.

5. Limitations

A consistent finding in these surveys is the strong association between perceptions of risk likelihood and risk impact. In the GRSP survey the correlation between the perceived likelihood of any given risk and its perceived potential negative impact was nearly 0.5 ($r_s = 0.48$, $p < 0.001$) with similar relationships observed in earlier versions of the survey (Garschagen et al., 2020), and in the WEF Global Risks Reports (WEF, 2020, 2021). Potentially, experts are relying on the availability heuristic, where risks that are more deadly or reported more frequently by media are in turn viewed as being more probable (Slovic et al., 1981). However, alternative explanations are also reasonable. For instance, respondents are asked to assess the likelihood “of each risk occurring globally (with impacts across multiple countries) within the next 10 years” Since risks with greater potential for negative impacts overall are more likely to cross those thresholds (e.g., in the case of Anthropocene risks (Keys et al., 2019) or systemic risks (Renn et al., 2020)) they will also be rated as having a higher likelihood. Thus, a correlation can be expected, except in the case of risks which are perceived to be particularly dangerous but unlikely (e.g., weapons of mass destruction).

Another potential source of bias is an inflated perception of environmental risks from a concentration of subject matter experts. Despite efforts to enlarge the range of surveyed scientific expertise by recruiting a variety of organizations representing either broad expertise (e.g., The International Science Council) or more narrow but otherwise unrepresented expertise (e.g., the International Observatory on the Social Impacts of AI and Digital Technology), environmental experts were still overrepresented. Since subject matter expertise, affluence, and vulnerability, among other factors, have been shown to influence risk perceptions (Barke & Jenkins-Smith, 1993; Fatemi et al., 2017; Slimak & Dietz, 2006) we ran an ordinal mixed effects model to account for subject matter expertise and the per capita Gross Domestic Product of the nation where the respondent is based, finding that expertise was not a significant predictor of environmental risk perception (Table S1). Additionally, because the WEF sample also rated environmental risks more highly (despite having a concentrated expertise in economic matters), we suspect that subject matter expertise is not the primary driver for the observed high levels of concern about environmental risks. Instead, we suggest that surveyed scientists targeted through the GRSP survey and business and economic communities targeted through WEF's survey are united in viewing environmental risks as disproportionately likely and impactful in the coming years.

6. Conclusions

While the COVID-19 pandemic dominated headlines throughout 2020 and 2021, experts in both economic and scientific communities still view environmental risks, especially climate change, to be critical to global well-being. Some of the worst harms from environmental risks may not come to pass immediately, but there is evidence that continued use of fossil fuels, failure of governments and businesses to engage in effective climate adaptation and mitigation measures, environmental degradation, and overexploitation of natural resources may lock-in negative impacts if transformational action is not taken in the short term.

At present, the global community has pivoted its attention to new challenges including the war on Ukraine and the consequent energy crises. Much as the economic recovery from the COVID-19 pandemic offered a (mostly squandered) opportunity to tackle climate change (Nahm et al., 2022), there is the potential to respond to the current inflationary and energy crises with policies that benefit citizens while simultaneously cutting greenhouse gases (ECIU, 2022; IEA, 2022; Pedersen et al., 2022). Because of the long timelines on which climate change unfolds, there will often be more proximate risks competing for the attention of world leaders, policy makers, and businesses. The challenge for these actors will be to continually ramp up ambitions in addressing climate change while still addressing these risks as they develop.

Data Availability Statement

All data used for this research is available with the paper. Data is available at: https://osf.io/w6jst/?view_only=24540f1567db4a5d845507e42f841933. Figures prepared in R Version 4.0.2.

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