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The activism responsibility of climate scientists and the value of science-based activism

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Scientists have the right and responsibility to engage in activism—from the translation of their work in societal outputs to the participation in policy or civic events—because their expertise and ethical responsibility position them well to change policy. Similarly, civic groups that engage with scientific evidence make their actions more credible and effective. Lastly, collaborations between researchers and activists enhance the inclusiveness of climate science and action.

The recent comment in this journal that called for climate scientists to be more 'neutral' and disengaged from climate activism[1] does not provide good guidance for scientists dealing with urgent social and environmental challenges. It fails to define its key terms ('science' or 'activism') and provides only general truisms as to what good science entails.

In this *Matters Arising*, we argue that the broader societal role scientists can play should be recognized and respected. We also call for the support of activists who engage with researchers in pursuit of evidence-based action. Mutually supportive relations between science and civic groups will make science more horizontal, inclusive, and thus legitimate and impactful in the eyes of policymakers and society at large.

Scientists engaging in activism

Scientific activism refers to the efforts of individuals and groups to advance social and political change by directly identifying and pointing at trends, drivers, and solutions for—in the environmental or climate domain—degradation, resource exploitation, or contamination[2,3]. Activism often includes combating the economic, political, and cultural structures and inequalities that produce unjust outcomes or procedures[4]. When scientists engage in activism, it does not mean that they necessarily take the streets. Science activism, which occurs throughout the social, natural, or engineering sciences, is diverse in strategies and practices and is spread across climate science themes and inquiries[5]. Among others, it is embodied in ecologists, anthropologists and/or sociologists engaging with social groups and communities affected by climate impacts and supporting their environmental and social impact assessment with data collection and analysis; in earth scientists, philosophers, and/or geographers writing and producing artwork and documentaries that translate scientific knowledge about disruptions in oceans cycles and fisheries for non-academic audiences; in legal experts, geologists, and/or chemists or social scientists testifying in front of congress or during lawsuits about indigenous groups' livelihoods affected by oil or mining companies; in economists, planners, and policy analysts participating in policy or civic events about the green transition in cities; or in inter-and trans-disciplinary scientists co-producing new knowledge directed at identifying transformative solutions across sectors (e.g. agriculture, industry, transport).

Scientific activism is integral to the constitution and history of science. Think of Darwin's debates with religious authorities, Snow's work on cholera, or Rachel Carson's *Silent Spring*. Entire branches of science (medicine, conservation biology) are defined by their activist agenda. Likewise, activism, for example through Stephen Schneider's work (a contribution Büngten sadly ignores), is integral to the constitution of climate science[6]. This activism recently manifests in widely commented, popular books such as Mann's *Our Fragile Moment*[7], Klein's *On Fire: The (Burning) Case for a Green New Deal*[8], or Mendez' *Climate Change From The Streets: How Conflict And Collaboration Strengthen The Environmental Justice Movement*[9]. For the last 15 years or so, calls for activism through or in climate science have multiplied, urging scholars to engage in activism as an ethical and social duty beyond traditional roles of writing journal articles or managing research[10,11]. This can even include civil disobedience[12], in a bid to accelerate political and societal action towards climate change.

Scientists who engage in activism do so still fulfilling the highest practices of rigorous, transparent, and reliable research. Those are particularly important in efforts to counter misinformation around, denial of, or conspiracy against action to mitigate climate change. Our professional integrity demands that our advocacy be based on factual and comprehensive evidence that passes the highest (including but not only peer-reviewed) tests, critically and reflexively. Many of us also voluntarily offer our time outside

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institutional responsibilities towards reports for international bodies (IPCC, IPBES, or National Assessments), national or regional governments, and civil society sectors. There, we have the responsibility to "report detailed and trustworthy uncertainties," as Büntgen calls for. He is mistaken to argue that these principles are necessarily harmed by activist engagement.

Neutrality and bias

Put differently, scientists can be rigorous, objective, *and* engaged, all at the same time. This does not necessarily imply neutrality. All people, including scientists, act upon this world based on an intertwined web of worldviews, values, and knowledge, which influence their ontology and epistemology and, consequently, their assumptions, hypotheses, and methods. As Science and Technology Studies have shown, science depends on observation, measurements, and testing (formal objectivity) as well as the social history and practices, interests, material resources, and institutions within which science is embedded, thus making science inherently political[13]. While objectivity grounded in a given ontology and epistemology is imperative, neutrality is not. Feminist scholarship has also discussed how and why objectivity is better understood as situated—objectivity as positioned rationality—and knowledge is always partial, grounded in a place of production, through specific tools for "seeing" and "knowing"[14].

Furthermore, Büntgen's advocated detachment from engagement comes from a privileged academic position in the global North. What about those scientists amid climate disasters, living impacts firsthand, and often working in precarious labor conditions and daily unsafe circumstances? As they are physically confronted with disasters, many also use science for the public good, mobilizing resources and knowledge to support improved climate adaptation. We cannot see how such "personal" interests threaten scientific rigor. Surely, the a priori interest of such scientists in the results of their work is for better and impactful science, not biased science.

Such engagement and care for and with society is part of our moral responsibility as scientists. Where our findings merit it, we need to advocate for real change, carefully weighing in tradeoffs, uncertainties, and rebound effects, and express our caring for people and nature, especially the politically disempowered, vulnerable, and marginalized, which by the way, are often also marginalized from scientific and academic institutions, as the Black Lives Matters movement recently evidenced[15].

Büntgen considers the professional responsibility of researchers through a narrow view of science; one that does not recognize the variety of biases that can afflict our work. Recent research has, for example, revealed strong global North biases in the production of science on the relationship between nature and human wellbeing[16]. Büntgen's own mention of "sustainable growth" is still subject to the growth bias that afflicts mainstream responses to climate change.

His call for a "neutral science [that] should remain unbiased" fails also to account for how research is funded and who writes about certain topics and why. All scientists depend on public and private funds that, directly or indirectly, attempt to shape the research agenda, by bringing on certain topics and questions and foreclosing others. Since early 2025 the massive research cuts throughout the scientific architecture of the United States evidences the threats scientists face every day. It is thus also the responsibility of scientists to unmask those interests that bias scientific production through funding structures. This is also science activism. Scientists' advocacy can eventually help open funding calls toward new questions and topics and secure more funding for new research. This is particularly important for the social sciences of climate mitigation, which reportedly only receive 0.12% of all research funding[17].

A more horizontal relationship between scientists and civic groups

In contrast with Büntgen's position, we advocate a model of climate science that is co-produced and thus in conversation and collaboration with relevant social and affected groups as well as non-academic experts.

Climate justice activists and related NGOs often base their campaigns on robust, peer-reviewed scientific research and on knowledge produced by scientists. Scientists' advocacy here is driven by evidence and the urgent need for action, not personal or political biases. Many activists maintain transparency about their methodologies and findings, ensuring that their campaigns are grounded in solid evidence. Activists have an ethical duty to advocate for policies that prevent harm and promote sustainability, aligning with scientific findings[18].

Activists also build networks with scientists and gain visibility and legitimacy in their struggles against, for example, land contamination and resource extraction in indigenous territories for the benefit of "clean" energy batteries for electric vehicles[19]. They reach out to scientists to help identify trends of climate-resilient infrastructure displacing working-class residents through dynamics of real estate speculation[20], questioning the neutrality and so-called universal benefits of nature-based solutions for climate change[21,22]. Many climate litigation cases rely on strong and engaged scientific knowledge, including, as examples, the Juliana vs. United States (2015) against the US government and the Milieudefensie et al. vs. Royal Dutch Shell (2021) case against the oil company. These collaborations build activists' capacity and help protect their constituency, their territory, and their livelihoods.

Through knowledge co-production, decolonized science—science produced beyond Northern epistemologies[23] — becomes possible through locally driven alliances and evidence from scientists and civic, local, or traditional experts, whose knowledge is rendered equally legitimate and credible. In this process, civic groups and scientists build and interpret context-applicable knowledge that can be shared by co-designed strategies, providing local groups with "public legitimacy, visibility, and political leverage"[24].

For at least two decades now, climate and environmental justice organizations and their networks have coined concepts, such as "ecological debt", "biopiracy," "food sovereignty," "land grabbing", "greenwashing," or "degrowth" that have set scientific agendas[25]. Those dynamics allow for the recognition of different forms of knowledge and expertise from outside the academia that help address climate change. Conversely, scientists have applied them in research and further elaborated on them. Some renowned intellectuals have long blended science and activism in their writings, such as Bina Agarwal on women's unequal participation in forest governance[26] or Bob Bullard on the disproportionate impact of environmental hazards[27], including climate change, on marginalized communities. Those in turn have bolstered the efforts of activists and legal teams.

The engagement of climate scientists in activism also builds on a venerable tradition that includes, for example, lobbying against nuclear weapons, against the interests of tobacco companies, and for the protection of the ozone layer. Scientists have long gone out and beyond their traditional roles of publishing prestigious yet inaccessible papers for limited audiences, in ways that transcend narrowly defined 'impact' agendas. Important funding bodies such as the European Research Council (ERC) are increasingly accounting for the impact of scientific production on society and policy and valuing the knowledge translation and dissemination work of the scientists they evaluate, not only their academic production and productivity. The value and importance of doing so are also reflected in the growing number of signatories endorsing the global Agreement on Reforming Research Assessment (www.coara.eu).

Beyond these large funding bodies and initiatives, it is time for academic and research institutions to value scientists' activism and to support those who practice it in navigating the tensions that can exist between scientific inquiry and activism[10,28]. This recognition and support are particularly important for women and other minority scientists who take part in public engagement work, yet their contributions are less likely acknowledged or called for in the media[29,30]. The urgency of climate change, and other pressing socio-environmental issues, demands the most rigorous science of which scientists are capable of, and the collective—societal and academic—action upon it.

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Author contributions

I.A. drafted a substantial part of the original manuscript which was then enriched and edited by M.C., D.B., E.C., M.W., U.P., F.S., and P.K. M.C. and D.B. also provided structural edits and changes.

Competing interests

The authors declare no competing interests.

Additional information

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