

ADVANCED REVIEW

Clumsy solutions and climate change: A retrospective

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Abstract

In 1989, Steve Rayner chided fellow anthropologists for “fiddling while the world warms.” This was the starting point of a decades-long application to human-made climate change of the cultural theory that he had developed with Mary Douglas and Michael Thompson. It culminated in a call to develop “clumsy” solutions for addressing the issue. Since then, the concept of clumsy solutions has been applied, praised, and criticised. To clarify its strengths and weaknesses, I first set out cultural theory and explain how the notion of clumsy solutions was derived from it. I then assess the extent to which this notion has increased our understanding of climate change governance. I do so by breaking up the application of this concept into seven predictions, concerning: (1) the major perspectives among stakeholders on how to resolve climate change; (2) the fate of the 1997 Kyoto Protocol; (3) the feasibility of international emissions trading; (4) the possibility of making renewable energy competitive; (5) the need for domestic governmental action to realize this possibility; (6) the effectiveness of a nonbinding global treaty to combat climate change; and (7) the need to explore adaptation, carbon capture, and geoengineering. I show that these predictions have stood the test of time. Finally, I discuss the roles that the concept of clumsy solutions can play in future climate change governance. This article is written in memory of Steve Rayner, one of the first social scientists to focus on climate change.

This article is categorized under:

Social Status of Climate Change Knowledge > Sociology/Anthropology of Climate Knowledge
Climate, History, Society, Culture > Thought Leaders

KEYWORDS

clumsy solutions, energy transition, Steve Rayner

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1 | INTRODUCTION

1.1 | In Memory Of Steve Rayner (1953–2020)¹

In 1989, Steve Rayner chided his fellow anthropologists for “fiddling while the world warms” in an editorial in *Anthropology Today* (the Royal Anthropological Society’s journal). Rayner’s intervention was the starting point of a decades-long application of the cultural theory that he had co-developed to human-made climate change. This research culminated in a call for “clumsy” solutions to address this complex set of issues. Since then, the concept of clumsy solutions has received both praise and criticism in the study and praxis of environmental governance. It has for instance informed US EPA’s participatory processes (Stahl & Cimorelli, 2020; US EPA, 2022), UNESCO’s climate change adaptation strategy for its world heritage sites (Perry, 2015; Perry & Falzon, 2014), and the policy planning of the Netherlands Environmental Assessment Agency (de Vries & Petersen, 2009; Ludwig & Kok, 2018). In contrast, Sven-Ove Hansson (2020) has opined that cultural theory’s application to climate change amounts to “climate science denial.”² To assess the utility of the concept of clumsy solutions for addressing climate change, I first set out cultural theory and describe how the notion of clumsy solutions was derived from it. Thereafter, I illustrate its application to climate change using seven predictions concerning climate change policy that were formulated in the 1990s and 2000s and evaluate the degree to which these predictions have been confirmed. I conclude by briefly describing how the idea of clumsy solutions can inform future climate change governance.

2 | SOCIOCULTURAL VIABILITY THEORY

Cultural theory (shorthand for “theory of sociocultural viability”) was pioneered by anthropologist Dame Mary Douglas (1978, 1982), and further developed in collaboration with her former PhD students Steve Rayner (1992) and Michael Thompson, as well as political scientist Aaron Wildavsky (Thompson et al., 1990), among others. According to the theory, the near-endless sociocultural variety that characterizes human life across time and space is in part produced by interactions among adherents to four “elementary” ways of organizing, perceiving, justifying, and experiencing social relations, labeled egalitarianism, individualism, hierarchy, and fatalism. Each of these “ways of life” consists of a particular mode of organizing social relations and a supporting cultural bias, including views of nature, human nature, time, space, risk, technology, etc. Douglas derived these ways of life by assigning “high” and “low” values to two fundamental social dimensions: “grid” (i.e., the extent to which ranking and stratification constrain the behavior of individuals) and “group” (that is, the extent to which an overriding commitment to a social unit constrains the thought and action of individuals). Egalitarianism is characterized by a low level of stratification and a high level of group solidarity. Individualism is also associated with a low degree of stratification but displays weak group solidarity and boundaries. Hierarchy is typified by a high degree of both stratification and group solidarity and boundaries. Fatalism combines a high level of stratification with little group solidarity and weak group boundaries. These four ways of organizing, perceiving, and justifying social relations embody different normative ideals: egalitarianism emphasizes group solidarity and equality of condition; individualism promotes individual freedom and equality of opportunity; hierarchy strives to achieve stability, predictability, and orderliness; while fatalism aims for personal survival in a volatile, dangerous world (Figure 1).

Cultural theory expects all four ways of life to be present in any social domain—from a primary school to an international environmental regime. This is the case as each way of life contains self-undermining features that can only be corrected by others. For instance, individualism presumes equality of opportunity, which in the long run can only be ensured by state redistribution of resources (a hierarchical tool), which itself is often prompted by egalitarian protests of accumulating inequalities. As all ways of life contradict one another, social life is argumentative: debates over pressing social and environmental ills tend to feature a variety of policy perspectives drawn from all four ways of life. Nevertheless, people compare the truth claims (regarding nature, human nature, risk, etc.) of their preferred ways of life with their perceptions of the world. If the discrepancy between expected and perceived reality becomes too glaring, they will be induced to switch to another way of life. This is bound to happen when a way of life comes to outsize others.³ No longer properly balanced, the shortcomings of the predominant way of life will become increasingly apparent, thus making other ways of life more appealing. As a result, the four ways of life are forever gaining and losing adherents.

Cultural theory has not been without its critics (Ostrom & Ostrom, 1997; Sjöberg, 2003—for a rebuttal, see Six, 2008). One criticism sometimes raised is that cultural theory is unfalsifiable (Boholm, 1996). Approaches are unfalsifiable when their core concepts (such as “norms,” “values,” “interests,” or “identities”) are overly generic and can be

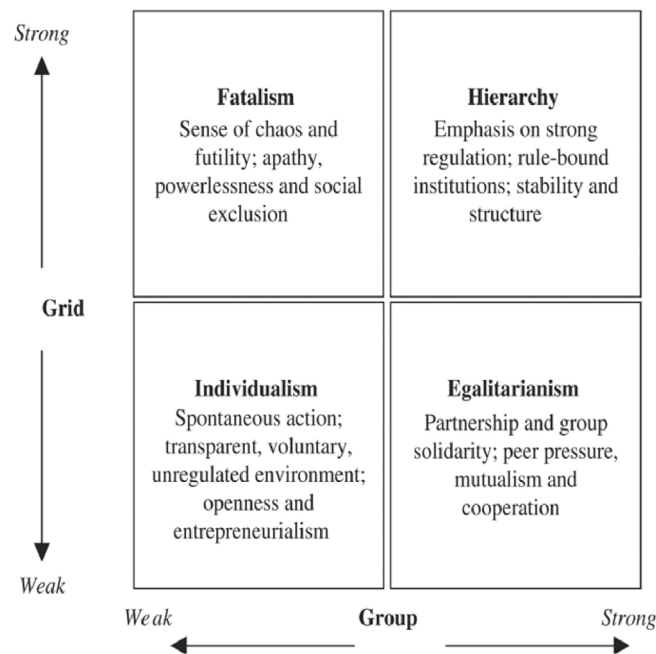


FIGURE 1 Mary Douglas's grid-group typology

applied to almost any human action or motivation. Yet, cultural theory's four ways of life have been fleshed out to a considerable degree. The social relations that underpin them are logically derived from two clearly defined dimensions (Gross & Rayner, 1985). Moreover, each cultural bias contains a particular view of nature, view of human nature, perception of time and space, learning style, preference for technology, way of matching needs and resources, risk attitude, sense of justice, etc. In an overview of the literature, Hofstetter (1998, pp. 47–48) identified 60 beliefs and norms for each cultural bias. This level of precision renders cultural theory falsifiable. The approach would be contradicted if it were shown that other ways of organizing, perceiving, and justifying social relations than the ones set out in cultural theory were to play major roles in human life. The cultural theory would also be negated if social domains did not contain all four of its ways of life, or if its social patterns did not coincide with the predicted cultural biases. To date, the approach has been supported in studies using a variety of research methods, including experiments, survey-based statistical studies, social network analysis, agent-based modeling, Q methodology, and participatory action research, as well as case studies (for an overview, see Johnson & Swedlow, 2021).

2.1 | Clumsy solutions

Cultural theory's assumption that each of its ways of organizing, justifying, and perceiving social relations needs all the others—even though it also contradicts them—has ramifications for governance (Hendriks, 1999; Rayner, 1986; Schwarz & Thompson, 1990). These ramifications can be stated as two hypotheses (Thompson, 2003):

1. The “elegant failures” hypothesis: Attempts to deal with complex social and environmental problems that do not incorporate all ways of life will be ineffective. Not only will these attempts fail according to the goals and values prioritized in the neglected ways of life, but they will also fail on their own terms.
2. The “clumsy solutions” hypothesis: Efforts to resolve complex social and environmental issues that reach their goals combine all ways of life.

The term “clumsy” is deliberately counter-intuitive and meant to indicate that effective governance combines opposing ways of organizing, perceiving, and justifying social relations. It also suggests that many public policy tools (such as cost–benefit analysis or social return on investment analysis) are, at least by themselves, insufficiently pluralistic, when addressing complex problems. Still, sometimes the term “polyrational” (Davy, 2004) is preferred instead. “Complex”

problems are social and environmental challenges characterized by nonlinear and emergent processes (Rogers, 2008). They encompass problems that are “wicked” (Rittel & Webber, 1973), “ill structured” (Simon, 1973), and “messy” (Ackoff, 1974). Moreover, the two hypotheses are not each other’s opposite. This is the case as each monolithic form of governance is predicted to fail, whereas not every combination of cultural theory’s ways of life can be expected to succeed. The hypotheses also do not imply that every stakeholder will necessarily endorse a particular clumsy solution. There may be various ways of combining cultural theory’s ways of life in a particular situation, all of which will have different distributive and ecological consequences. Stakeholders can be expected to continue to argue for those combinations that make more use of their preferred ways of life than others.

Furthermore, the clumsy solutions hypothesis does not entail that a polyrational solution will make all actors better off in material or financial sense. Each of the four ways of life generates material losses for some actors. For instance, some will thrive (through hard work, talent, and/or fortune) in the competitive processes prescribed by individualism, whereas others will not. As clumsy solutions consist of creative combinations of all ways of life, it can therefore not be excluded that they render some actors materially worse off. Still, clumsy solutions should satisfy the normative and policy preferences of adherents to all ways of life more than elegant, more monolithic forms of governance. As such, they are always based on a comparison and resemble John Rawls’s (1987) concept of “overlapping consensus” and Cass Sunstein’s (1995) notion of “incompletely theorized agreements,” that is, forms of governance that are acceptable to most stakeholders albeit for very different normative reasons.

Finally, the two hypotheses stated above represent a static take on clumsiness. A dynamic one is also possible (Rayner, 2010). This interpretation stresses that combinations of different ways of life allow for faster “strategy switching” than more monolithic solutions, when changing conditions require this. Empirical evidence for the idea of clumsy solutions has come from a wide variety of case studies, ranging from integration policies in the Netherlands, via electricity provision in Nepal, to the restoration of the Rhine (Frame, 2008; Gyawali et al., 2017; Hartmann, 2011; Verweij, 2011; Verweij, 2017; Verweij & Thompson, 2006). This evidence suggests that many attempts to resolve pressing environmental and social issues are insufficiently polyrational, underlining the practical need for clumsy solutions.

2.2 | Cultural theory and climate change

The main application of cultural theory’s clumsy solutions-concept to climate change consists of a critique of the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change and the advocacy of a more effective way of combating climate change (Hulme, 2009; Rayner & Malone, 1997; Thompson & Rayner, 1998; Verweij et al., 2006). The Kyoto Protocol bound “Annex I” countries (basically the members of the Organization for Economic Cooperation and Development minus Mexico and South Korea, but plus the Eastern European countries) to reduce their greenhouse gas emissions by 5.2% by 2012 (as compared to 1990). At this pace, 30 Kyoto Protocols were going to be needed to stop global warming (Malakoff, 1997). Subsequently, the treaty’s original aim of a 5.2% reduction in the emissions of affluent countries was lowered to a mere 2% by concessions that aimed to convince the governments of Australia, Canada, Japan, New Zealand, and Russia to ratify the treaty. Due to these concessions, the Protocol was finally able to enter into force in 2005. The United States—then the world’s largest emitter of greenhouse gases—was not part of the treaty after its Senate had voted 95 to 0 against ratification. Brazil, China, India, Indonesia, South Korea, and Saudi Arabia—all among the 20 highest emitters—also remained exempt from obligations.

Cultural theorists were not persuaded by this lack of ambition (Rayner & Malone, 1997; Verweij et al., 2006). Our analysis highlighted two structural flaws in the architecture of the Kyoto Protocol. The first of these was that the Protocol constituted an attempt to reach an agreement among a majority of states that included mandatory targets. Such attempts are difficult to achieve, are time-consuming and hand many states a veto, thus leading to the lowest common policy denominator. The second flaw was that the treaty was built on the assumption that curbing climate change was inevitably going to be quite costly for states. We argued that as long as this framing of the problem prevailed—namely, that the prevention of climate change is an expensive but necessary undertaking (a “public good”) that can only be provided through a global treaty with mandatory targets—the issue would not be resolved.

More conceptually, we argued that the Kyoto Protocol (and the underlying UNFCCC framework) represented a largely hierarchical policy perspective due to its reliance on formal, binding intergovernmental treaties that spell out which states were supposed to do what, when, and how to resolve a hugely expensive global public good. This even applied to its implementation mechanism that allowed “carbon emissions trading” (both among states and among

companies). This mechanism might have sounded like a market instrument, but it wasn't, as it created barriers to entry into industries, generated huge administrative costs (for states as well as firms), and rewarded economically unsuccessful states and companies, while punishing economically successful ones. Due to its predominantly hierarchical nature, we predicted that the Kyoto Protocol would fail to reach its goals as it ignored important insights offered by other policy perspectives.

In particular, we pointed out that the hierarchical discourse out of which the Kyoto Protocol had emerged had overlooked the rapid decline of the production costs of renewable energy, and the opportunities that this afforded to make the fight against climate change economically beneficial. We argued that states had many instruments at their disposal to help companies and other organizations reduce the production costs of renewable energy below those of fossil energy. Unleashing these instruments (such as shifting subsidies and tax breaks from fossil to renewable energy, greatly increasing R&D budgets for renewable energy, freeing up investment funds, installing smart electricity grids and investing in a myriad of other infrastructural changes, training engineers and installers, organizing public awareness campaigns, etc.) was going to be costly. Yet, if the quest to make renewable energy cheaper than fossil energy was successful, then great economic benefits would also accrue, especially for those countries and companies that were "first movers" and for developing countries that could leapfrog to the latest technology. Wielding these domestic policy instruments would therefore often be in the economic (and environmental) self-interest of states. Moreover, once the production costs of renewable energy were lower than those of fossil energy, it would be in the financial self-interest of companies and households all over the globe to switch. These considerations greatly reduced the need for a global treaty with legally binding reduction targets. Hence, we pleaded for a treaty that set ambitious goals for reductions in greenhouse gas emissions but that was nevertheless based on voluntary (rather than mandatory) national pledges. We also advocated expanding climate change adaptation policies as well as undertaking critical analyses of the possibilities and problems of geoengineering and carbon capture.

As compared to the Kyoto Protocol, this proposed set of measures catered more to the policy preferences of all ways of life: utilizing competitive market forces is an individualist ideal; unlocking these forces with the help of a battery of state initiatives is a hierarchical prescription; replacing global fossil energy markets with more local production and consumption of renewable energy is an egalitarian recipe (Toke, 2018); and adapting to climate change as and when it happens is a fatalistic move.⁴ We believed that our clumsy proposal provided a more effective way of addressing climate change.

3 | FORECASTING CLIMATE GOVERNANCE

How well has our clumsy analysis stood the test of time? To answer this question, it is helpful to break it up into a series of predictions:

1. The Kyoto Protocol would not successfully reach its tiny goals and would not be succeeded by a similar treaty (Rayner, 2006; Rayner & Malone, 1997).
2. International trading of carbon emissions (an "implementation mechanism" of the Protocol) would be costly and ineffective (Bartle, 2009, p. 699–700; Rayner, 2008; Verweij et al., 2006, pp. 832–33).
3. The production costs of renewable energy and fossil-free forms of transport would fall below those of almost all forms of fossil energy in 10–20 years (Rayner, 2007, p. 16; Verweij et al., 2006, pp. 833–835).
4. This would not mean that market forces by themselves would be sufficient to curb climate change, as many energy companies, banks, and other financial institutions would remain overinvested in fossil resources. Hence, it would be imperative to launch at both the national and local level an array of governmental programs that would help lower the costs of renewable energy below those of coal, gas and oil (Patt, 2015; Rayner & Malone, 2001, pp. 194–197; Shackley & Green, 2007, p. 234).
5. It would be helpful if these domestic efforts were supported by a global treaty that did not contain mandatory, but only voluntary, reduction goals. Such a treaty would be more effective, more widely endorsed, and easier to agree upon than the Kyoto Protocol (Gerlach & Rayner, 1988; Hulme, 2010, p. 18; Rayner, 1991; Verweij et al., 2006, p. 835).
6. Furthermore, it would be useful to undertake critical analyses of the opportunities and risks of adaptation to climate change, carbon capture, and geoengineering (Heyward & Rayner, 2013; Rayner & Malone, 1997, pp. 332–333; Shackley & Thompson, 2011).

7. Citizens and policymakers' understandings of the problem of climate change could usefully be represented by the four perspectives (namely, egalitarian, individualistic, hierarchical, and fatalistic ones) from which our proposed set of solutions had been derived (Hulme, 2009; Malone, 2009; O'Riordan & Rayner, 1991; Thompson et al., 1998, pp. 334–346).

These cultural theory-based predictions were mostly formulated between 1997 and 2009. They were risky in both a Popperian and a professional sense. At the time, the majority of policy analysts insisted that “there is no alternative to the Kyoto Protocol” (Müller et al., 2001) and that the treaty “was just a first step” that was to be followed by similar ones (UNFCCC, 2003, p. 25). Many economists also disagreed with our stance. As Paul Krugman (Klein, 2019) recently acknowledged, most economists involved used to sing the praises of carbon trading. Finally, energy experts and governmental agencies tended to downplay the extent to which, and the rate at which, renewable energy could become competitive (Kurmelovs, 2021). For instance, from 2000 to 2019 the International Energy Agency significantly underestimated the commercial potential of renewable energy in its World Energy Outlook (Hoekstra et al., 2017; Teske, 2021). Hence, our predictions not only forbade easily foreseeable futures, but also flew in the face of much expert opinion at the time.

Nevertheless, the predictions have stood the test of time, while the resulting policy prescriptions have increasingly been adopted by decisionmakers and academics. Regarding prediction no. 1, empirical findings can be grouped into two sets. The first of these posits that the Kyoto Protocol's tiny overall target had not been met by the time the Protocol's “first commitment period” ran out in 2012 (Aichele & Felbermayr, 2013; Almer & Winkler, 2017; Rosen, 2015). The second set of studies (Kim et al., 2020; Kuriyama & Abe, 2018; Shislov et al., 2016) concludes that the Protocol's overall target was met, but only because of the emissions reduction caused by: the implosion of heavy industry in Eastern European countries after their transition from communism; the outbreak of the 2008 global financial crisis; the transfer of polluting activities to countries without treaty obligations; and the purchase of carbon units from less affluent countries by Annex I states (75% of which did not lead to genuine reductions of greenhouse gas emissions [Kollmuss et al., 2015]). In line with our first prediction, neither result can be called a success. Contrary to our prediction, a second commitment period under the Kyoto Protocol was agreed upon. But this Doha Amendment only came into force in December 2020 (i.e., after a hiatus of 8 years) and currently binds a mere 29 states plus the European Union, which together represent less than 13% of global emissions (Mayer, 2020; UNFCCC, 2021). Moreover, in 2015 the Paris Agreement came into existence. This agreement resembles the international treaty for which we had long argued, in that it is based on voluntary rather than mandatory commitments. The Paris Agreement has now taken center stage in international climate change governance, relegating the Kyoto Protocol and its Doha Amendment to a sideshow.

The second prediction has also been empirically supported. Until recently, a large majority of economists—81% to be precise (Howard & Sylvan, 2015)—supported the creation of “carbon markets” in which companies could buy or sell rights to emit greenhouse gases, thus establishing a “carbon price.” These ideas have especially been implemented through the E.U. Emission Trading System established in 2005. Experience with this trading system has shown that the buying and selling of emission permits are cumbersome, prone to speculative busts and booms, hardly incentivizes companies to change their behavior, and is therefore ineffective (Berta et al., 2017; Carratù et al., 2020; Creti & Joëts, 2017; Friedrich et al., 2020). This is what we had foreseen. As Krugman (Krugman and Klein, 2019) conceded: “Economists did everyone a disservice by putting so much weight on carbon pricing... [I]t's not like we need a whole lot of complicated incentives to induce people to move on many margins.”

The third prediction has been validated as well. Having woken up to the potential of renewable energy, the International Energy Agency (IEA, 2020a, p. 12) stated recently that:

Solar PV [photovoltaics] and onshore wind are already the cheapest ways of adding new electricity-generating plants in most countries today. In countries where good resources and cheap financing are available, wind and solar PV plants will challenge existing fossil fuel plants. Solar projects now offer some of the lowest-cost electricity in history. Overall, renewables are set to account for 95% of the net increase in global power capacity through 2025. Total installed wind and solar PV capacity are on course to surpass natural gas in 2023 and coal in 2024.

This has come about as the cost of electricity from solar photovoltaics fell 82% between 2010 and 2019, while that from concentrating solar power fell 47%, onshore wind 39%, and offshore wind 29% (IRENA, 2020, p. 12). Furthermore, electric cars are on a rapid ascent. In 2010, some 17,000 such cars were on the world's roads. Nine years later that number had risen to 7.2 million (IEA, 2020b, p. 10). In the next 5 years, electric cars are expected to become cheaper than equivalent models that run on diesel or petrol—due to greatly improved battery technology (McKinsey, 2021). It has also been estimated that electric cars create 300 times less waste than other cars (Transport and Environment, 2021). As a result of these technological changes, the Global Commission on the Economy and Climate (2018, p. 8) reckons that a

global shift to renewable energy would result in an economic gain of US\$ 26 trillion. In the early 2000s, we argued that such a shift would be economically beneficial (Verweij, 2001, p. 9).

Prediction four comprised the idea that, despite the economic boons that could be gained from a renewable energy revolution, for several reasons, this would not come about without large-scale governmental intervention. First, we pointed out that many powerful financial institutions, enterprises, and governments were heavily invested in fossil energy and would stand to lose financially from a rapid shift, despite overall economic gains for societies. Second, the existing infrastructure around the world had been built to facilitate fossil and nuclear energy, and had to be overhauled in order to service renewable energy. This prediction has also come true. The current, global transition to renewable energy is impressive but still too slow to prevent harmful climate change (McKinsey, 2021, p. 5). One cause of this is the extent to which the world's biggest banks continue to support fossil energy production. In the 5 years following the signing of the Paris Agreement, the 60 largest commercial and investment banks poured an estimated US\$ 3.8 trillion into fossil fuel production (Rainforest Action Network, 2021, p. 3). For this and other reasons, it is vital that governments develop and implement policies that usher in a large-scale technological transition towards renewable energy. The “European Green Deal” announced by the European Commission (2019), the “Green New Deal” put to U.S. Congress by Representative Alexandria Ocasio-Cortez and Senator Ed Markey (Ocasio-Cortez, 2019), as well as U.S. President Biden’s “Plan for a Clean Energy Revolution and Environmental Justice” (Biden-Harris Democrats, 2020) display the ambition of the policies we envisaged. If such plans are implemented, then it seems possible to limit global warming to 2 or perhaps even 1.5 degrees Celsius (Hertsgaard et al., 2022; Jotzo, 2022; Meinshausen et al., 2022; Pielke et al., 2022).

Prediction five has been empirically supported as well. The Paris Agreement closely resembles the international treaty we argued for in that it is global, sets ambitious goals and is based on voluntary commitments by states (Beumer et al., 2018, p. 710; Dimitrov et al., 2019, p. 3). It is possible to fault the current implementation of the Agreement. But if states are not willing to reach goals that they have voluntarily agreed to, then they will not accept making these goals obligatory under an international treaty. Moreover, the Paris Agreement contains a ratcheting up mechanism for increasing states' ambitions that is applied every 5 years (Sælen, 2020). As compared to the Kyoto Protocol, the Paris Agreement is less vulnerable to withdrawal from the treaty by a major state (Pickering et al., 2018), induces many more countries to take climate action, leads to more equality (in terms of greenhouse gas emissions) around the world (Zimm & Nakicenovic, 2020), is much more quickly agreed upon (Schneider et al., 2019), provides a governmental platform for sharing practices and ideas for preventing climate change (Raiser et al., 2020), and—according to Jennifer Morgan from Greenpeace and Elizabeth Northrop from the World Resources Institute (Morgan & Northrop, 2017)—accelerates the reduction of greenhouse gas emissions.

Prediction six has also fared well. Efforts at climate adaptation have been stepped up in many parts of the world with such programs as the E.U. Adaptation Strategy and the Covenant of Mayors for Climate and Energy (Aguar et al., 2018; Morgan et al., 2019), while Rayner's call to investigate the pros and cons of geoengineering has been echoed by the recent recommendation of the U.S. National Academy of Sciences, Engineering and Medicine (2021) to fund research into these emerging technologies with US\$ 100–200 million over the next 5 years. Moreover, an alliance of some of the biggest Silicon Valley companies recently announced that it will purchase US\$ 925 million worth of carbon removal from a variety of start-ups over the next 8 years to spur rapid innovation (Meyer, 2022).

The final prediction was that the policy perspectives of both stakeholders and citizens on climate change would fracture along the lines of cultural theory's four ways of organizing, perceiving, and justifying social relations. An array of statistical studies has shown that this has been the case (Bellamy & Hulme, 2011; Brink & Wamsler, 2019; Cambardella et al., 2020; Chuang et al., 2020; Goebbert et al., 2012; Guy et al., 2014; Hornsey, 2021; Jones & Song, 2014; Komendantova & Neumueller, 2020; Leiserowitz, 2006; McNeeley & Lazrus, 2014; Morss et al., 2020; Nowlin & Rabovsky, 2020; O'Riordan & Jordan, 1999; Price et al., 2014; Thaker et al., 2020; West et al., 2010; Xue et al., 2016).

In sum, cultural theory's predictions regarding climate change governance have been upheld, while its policy prescriptions have become commonplace. This is not to say that plausible criticisms could not be raised—though Hansson's (2020) claim that cultural theory induces climate science denial is clearly invalid. Much more reasonably, one could state that this analysis underestimated the extent to which a restriction of production and consumption (particularly in affluent countries) is needed to curb climate change (Koves & Bajmocy, 2022). This would amount to a greater emphasis on egalitarian preferences, such as for “degrowth.”

Moreover, one could argue that not all of the seven predictions discussed above inevitably follow from cultural theory. For example, from which cultural theory tenet can one logically derive future energy costs? Put somewhat differently, surely the concept of clumsy solutions does not constitute an infallible generator of successful collective action.

These are valid points. As mentioned above, the idea of clumsy solutions comes with two falsifiable hypotheses, namely that a monolithic form of governance will not reach its goals, and that effective governance combines all four ways of life. Predictions 1, 2, and 7 are straightforward applications (and implications) of especially the first of these hypotheses. Predictions 3–6 do not automatically follow from either hypothesis. Instead, they were inspired by them. As the hypotheses highlight the importance of basing governance on all ways of life, it invites analysts to investigate whether a particular governance discourse is dominated by a single (or two) way(s) of life. If this is the case, then this should trigger a detailed exploration of possible blindspots in the hegemonic ways of life, and the contributions that marginalized ways of organizing and perceiving can make to resolve the issues at hand. Regarding climate change, Thompson's (1984) seminal work on “energy tribes” had alerted cultural theorists that the domestic and international bureaucracies responsible for energy and environmental policies in OECD countries often clung to a hierarchical way of organizing and perceiving. This then allowed consideration of the limits to this approach, resulting in the arguments that these bureaucracies had underplayed the potential of renewable energy (a technology often promoted by more egalitarian stakeholders) and had overplayed the promise of nuclear energy (a long-standing hierarchical preference), and that climate change could not be resolved through global, binding treaties. Thus, the clumsy solutions-concept can serve as a source of creativity for designing more effective forms of governance and for reconstituting society (Hulme, 2009).⁵

4 | CONCLUSION

From a clumsy perspective, today's climate change governance appears to be in a much healthier state than before 2015. Nevertheless, vigilance remains necessary. The idea of clumsy solutions can continue to inform climate change governance in various ways. Its elegant failures-hypothesis can be employed for early detection and further prevention of such failure. For instance, the vigor with which (inter)governmental agencies, consultancies, and fossil fuel companies are currently striving to elevate hydrogen to a preeminent role in the energy transition—despite the obvious shortcomings of this technology (van Renssen, 2020)—is reminiscent of the extent to which nuclear power was favored in energy research, development and demonstration (RD&D) around the world during the second half of the 20th century. Hydrogen and nuclear energy are both technologies that require vast amounts of investments, infrastructure, expertise, RD&D, and state intervention in the market. As such, they match technological preferences that, according to cultural theory, are more prevalent in hierarchically organized organizations, such as governmental agencies or large companies. Hence, there is a risk that hydrogen will be accorded an overly dominant role in the coming energy transition. This is not to argue that hydrogen should not be supported or should not become a vital component of future energy systems. But it is important to avoid the mistakes of the past when the bulk of energy RD&D went to nuclear energy and very little was spent on renewable energy (Gallagher et al., 2011). Hence in the coming decades it will be imperative that all forms of renewable energy are supported and vigorously discussed.

Cultural theory's explanation for successful governance (i.e., its clumsy solutions-hypothesis) can also further support climate change governance. But it may first need further elaboration. Public administration scholars Martin Lodge and Christopher Hood (2010, p. 606) have formulated this challenge thus: “those advocating “clumsy solutions” have not shown very convincingly how such institutional systems can be consciously designed and maintained though they have shown that they arise spontaneously in some conditions.” Since then, various decision-making procedures have been proposed for facilitating clumsy solutions, including a “bricoleur” type of leadership (Grint, 2010), deliberative forums (Ney & Verweij, 2015), serious games (den Haan, 2020; Mochizuki et al., 2018; van der Wal et al., 2016), design thinking (Ney & Meinel, 2019), multisector systems analysis (Beck et al., 2018), social readiness framework (Bellamy, 2019), multi-criteria resource assessment (US EPA, 2021) and robust decision-making (Lempert & Turner, 2020).

Yet more research needs to be done before the challenge is fully met. This research could make use of various methods. These include most similar systems design, in which two cases of environmental governance are compared that employ different decision-making procedures but are otherwise alike. They also encompass lab and field experiments, in which randomly formed groups of people would be asked to resolve the same complex environmental problem with different decision-making tools, before a content analysis of the outcomes of their efforts would be undertaken. Participatory action research to create clumsy solutions would also be informative (see Scobolig et al., 2016; Senior et al., 2022; Vári & Linnerooth-Bayer, 2006). By employing a variety of research designs it might be possible to uncover which institutional settings and decision-making procedures allow stakeholders involved in climate change governance to generate clumsy solutions. Only thus may we learn to be fully clumsy.

AUTHOR CONTRIBUTION

Marco Verweij: Conceptualization (lead); investigation (lead); project administration (lead); visualization (lead); writing – original draft (lead); writing – review and editing (lead).

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Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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ENDNOTES

¹ Steve Rayner was James Martin Professor of Science and Civilization at Oxford University when he died in January 2020. From 1997 to 2007 he was a lead author of the Third and Fourth Assessment Reports of the Intergovernmental Panel on Climate Change.

² For a rebuttal see Verweij et al. (2022).

³ Gross and Rayner (1985) describe how to quantify cultural theory's ways of life.

⁴ As this proposal combines all ways of life, including hierarchy, it cannot be characterized as just representing a “bottom-up approach” (Depledge, 2022). Rather, it mixes top-down with bottom-up measures.

⁵ This is not to assert that cultural theory is necessarily the only conceptual source of such inspiration. Regarding climate change governance, similar proposals were made in Victor (2001), Scheer (2005), and the Hartwell Paper (Prins et al., 2010), which had not or only partly been influenced by cultural theory.

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