



HAL
open science

Anthropological grounds of climate equity principles

Matthieu Mandard

► **To cite this version:**

Matthieu Mandard. Anthropological grounds of climate equity principles. *Environmental Science & Policy*, 2024, 151, pp.103601. 10.1016/j.envsci.2023.103601 . halshs-04227925

HAL Id: halshs-04227925

<https://shs.hal.science/halshs-04227925>

Submitted on 10 Oct 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Anthropological Grounds of Climate Equity Principles

Matthieu MANDARD

University of Rennes

Center for Research in Economics and Management (CREM – UMR CNRS 6211)

11 rue Jean Macé, CS 70803 Rennes Cedex 7, France

matthieu.mandard@univ-rennes.fr

Anthropological Grounds of Climate Equity Principles

Abstract

As repeatedly acknowledged since the ratification of the United Nations Framework Convention on Climate Change in 1992, the equitable allocation of climate burden among parties is at the heart of climate negotiations. But while equity principles have been extensively addressed in the literature on climate policy, their fundamental underlying values remain elusive. Drawing on anthropology and relational models theory, this Perspective paper aims to shed light on this topic by showing that any climate equity principle corresponds to one of the four relational models people in all cultures use to implement their exchanges – and thus corresponds to their associated principles of distributive justice. Such a clarification may facilitate academic research on this topic, as well as the definition, the acceptance and, finally, the effective implementation of climate policies.

Keywords

Anthropology; climate equity principles; distributive justice; relational models theory

Anthropological Grounds of Climate Equity Principles

1. Introduction

Since the ratification of the United Nations Framework Convention on Climate Change in 1992, the equitable allocation of climate burden among parties is a key issue in climate negotiations (Dooley et al., 2021; Klinsky et al., 2017; Pottier et al., 2017). The main reasons are twofold (Frey and Burgess, 2022; Grecksch and Klöck, 2020; Höhne et al., 2014; Powers et al., 2022). On the one hand, perception of fairness positively affects the probability of reaching an agreement regarding how climate adaptation and mitigation measures should be distributed. On the other hand, agreements that conform to parties' interests are generally better accepted and thus implemented.

To accompany these political debates, the concept of equity has consequently been extensively addressed in the literature on climate policy and has been the subject of several attempts at classification, whether by grouping equity principles or by connecting them to theories of distributive justice (e.g., Davidson, 2021; Mattoo & Subramanian, 2012; Page, 2008; Ringius et al., 2002; Ryberg et al., 2020). Despite these efforts, however, there is still no consensus regarding the key similarities and differences between these principles and, as pointed out by various scholars, their fundamental underlying values remain elusive (Davidson, 2021; Dooley et al., 2021; Klinsky et al., 2017). This is problematic, inasmuch fairness is a fundamental condition for institutions to envision climate actions (Frey and Burgess, 2022; Grecksch and Klöck, 2020; Höhne et al., 2014; Powers et al., 2022).

In line with a growing literature convoking anthropology to illuminate climate change (e.g., Baer and Singer, 2018; Crate, 2011; Crate and Nuttall, 2016; O'Reilly et al., 2020), the objective of this Perspective paper is to draw on relational models theory to show that any climate equity principle corresponds to one of the four relational models people in all cultures use to implement their exchanges – and therefore corresponds to their associated principles of distributive justice.

Such a clarification may facilitate academic research on this topic, as well as the definition, the acceptance and, finally, the effective implementation of climate policies.

2. Relational models theory

Relational models theory is a framework for understanding social relationships proposed by the American anthropologist Alan Page Fiske in the mid-1980s and later published in a book entitled *Structures of Social Life: The Four Elementary Forms Of Human Relations* (Fiske, 1991) and in an article issued in the *Psychological Review* under the title “The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations” (Fiske, 1992). The basic tenet of this theory is simple: social life is essentially based on four relational models upon which people organize their interactions (Fiske, 2004, 1992, 1991). Labelled communal sharing, authority ranking, equality matching and market pricing, these models respectively posit that people may (1) treat each other as equivalent, (2) attend to their positions in ordered differences, (3) keep track of the imbalances among them, or (4) orient to ratio values (Fiske, 1992, 1991) – we further detail them in the next section. Of course, while analytically distincts, the theory acknowledges that these models are often employed in combination in everyday life.

Although originally developed in anthropology, this theoretical framework has garnered considerable attention and empirical support in various disciplines, such as psychology, sociology, neurology or management (Haslam, 2004; Vodosek, 2015), with a total of about 6,500 citations for its two seminal publications as of August 2023. However, surprisingly, to the best of our knowledge, it has not been transposed to the study of climate equity principles, though it turns out to be particularly useful on shedding light on their very nature. This is what we intend to do in the next section.

3. Relational models and climate equity principles

Several climate equity principles have been identified in the literature. We thus chose to focus on the most commonly used ones, which have been recently inventoried by Dooley et alii (2021). Here we show how each of them can be associated with one of the four relational models described by Fiske (Table 1).

Please insert Table 1 about here

3.1. Communal sharing: to each according to his needs

According to the relational model of communal sharing, people are not differentiated (Fiske, 1992). Group members treat each other as equivalent, with no regards for their individual identities. As Fiske puts it, the functioning of such a collective is well illustrated by the Marxist maxim: “From each according to his ability to work, to each according to his needs” (Fiske, 1992, p. 693). This is the kind of behaviour one can observe in families, in hunting and gathering societies or, more generally, between people who share close connections.

Communal sharing appears to be the ethical principle behind need-based equity, which posits that all human beings should be allowed to emit minimal levels of pollution in order to satisfy their needs (Dooley et al., 2021; Ringius et al., 2002). These levels of pollution do not have to be equal: in line with the communal sharing model, the least capable actors (e.g., those who have less natural resource endowments) may have less ambitious climate burdens to secure a decent standard of living¹. While criticized, as emitting greenhouse gas is seen by some authors as loosely correlated to the satisfaction of needs, such an approach is largely defended by less developed countries,

¹ Subsistence emissions that are necessary to satisfy basic needs are thus often distinguished from luxury emissions, which are those generated to satisfy non-basic needs (Ringius et al., 2002; Shue, 2019).

mostly located in South Asia and Africa, which are particularly concerned with poverty issues (Pottier et al., 2017; Tørstad and Sælen, 2018).

Here, rights are not acquired because people belong to the same family or to the same tribe, but because they are part of the same humanity, which induces a sense of community. This is what is acknowledged in the preamble of the 2015 Paris agreement, which states that as “climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights” (UNFCCC, 2015).

3.2. Authority ranking: to each according to his position

Authority ranking is characterized by the differentiation of people according to some social dimension (Fiske, 1992, 1991). Individuals may be positioned above others because of privilege, status or traditions, and are thus entitled to preempt more resources accordingly. Such relationships can typically be observed in military organizations, in caste systems or in religious institutions (Fiske, 1992).

Interestingly, this relational model is the ethical ground of the initial version of the controversial climate equity principle labelled grandfathering. Originating in 19th century racist laws promulgated in the southern U.S. states, the historical purpose of grandfathering was to allow actors to continue an activity by exempting them from new regulatory requirements that were imposed on others – the objective was initially to reserve the right to vote for white people, while excluding former slaves and their descendants (Damon et al., 2020; Robertson, 1995). Transposed to environmental issues, the idea was to offer the possibility for existing polluters to pursue their emissions – at least, temporarily – while imposing more stringent standards on new actors (Damon et al., 2020; Robertson, 1995). For instance, the 1970 U.S. Clean Air Act allowed old facilities to operate according to less strict pollution standards than similar new facilities (Nash and Revesz,

2007). Similarly, the 1975 U.S. Corporate Average Fuel Economy imposed pollution control on new cars while exempting existing vehicles (Levinson, 1999).

In recent decades, however, another definition of grandfathering has emerged (Damon et al., 2020). More often, regarding climate policy, grandfathering is now no more considered as an exemption from regulatory requirements, but as an allocation of emissions proportional to historical pollution levels (Damon et al., 2020; Knight, 2013). As a consequence, the associated ethical ground of this newly defined equity principle has shifted from authority ranking to market pricing – see section 3.4.

Nowadays, authority ranking is thus no longer a popular ethical ground of climate equity principles, with a notable exception: this is the rationale that can be found when some authors propose exempting poor countries from any contribution to climate change adaptation and mitigation – this is the so-called sufficientarianist perspective (Davidson, 2021). Here, contrary to grandfathering, such a differentiation is not based on temporal grounds but on economic ones, as it considers whether actors have secured enough of some goods for a basic standard of living (Shields, 2020).

3.3. Equality matching: to each the same

The model of equality matching posits that relationships should be evenly balanced (Fiske, 1992, 1991). Following this line of reasoning, everyone should get the same amount of goods, compensations or punishments regardless of their status or properties. This is the kind of relationship that can be observed between people such as colleagues or acquaintances, who are not intimate and who want to establish trustful interactions (Fiske, 1992).

As its name indicates, equality matching is the ethical foundation of the general equity principle called equality, which states that all parties should have the same obligations (Ringius et

al., 2002). While its formulation is simple, the concrete implementation of this general principle is actually debated (Dooley et al., 2021).

The more common approach is equal-per-capita, which assumes that all humans should be seen as equal and that everyone should thus have the same rights to pollute (Torpman, 2021). The Indian government was one of the first to defend this approach at the First Conference of the Parties that took place in Berlin in 1995, and it has since gained wide support among non-governing organizations (Pottier et al., 2017; Rajamani, 2008). Although equal-per-capita may seem attractive, it has been criticized for several reasons, such as ignoring peoples' needs, disregarding historical responsibility or forgetting differences in benefits and costs related to climate change adaptation and mitigation (Torpman, 2021).

To respond to these criticisms, another equality-based approach, labelled cost-effectiveness, has been proposed. It aims to distribute commitments in such a way that all actors have the same marginal mitigation cost (Davidson, 2021). Here, emissions in each country should be reduced up to a point where the monetary cost of an additional reduction becomes the same for all actors. In doing so, the objective is to achieve emission reductions at the global least cost (Ringius et al., 2002).

3.4. Market pricing: to each in due proportion

Finally, market pricing is a model in which relationships are based on proportionality: exchanges are regulated through ratios and rates (Fiske, 1992, 1991). To organize this kind of interaction, metrics such as prices, budgets, wages, interest rates or taxes have to be defined to serve as a reference (Fiske, 1992). Such relationships are particularly common in contemporary societies: prices are proportional to expected value, wages are proportional to working hours or to production, and punishments are proportional to crimes.

Market pricing is the ethical foundation of the various climate equity principles that are based on proportions. One of them is the capacity principle (also labelled ability to pay), which posits that climate burden should be distributed in proportion to economic resources – most of the time in proportion to GDP per capita (Dooley et al., 2021; Ringius et al., 2002). Wealthy actors should therefore contribute more to solve climatic issues than poor ones, irrespective of their role in these issues.

Market pricing is also the ethical perspective behind historical responsibility – also known as polluter pays. In contrast to the ability to pay approach, the general idea here is that climate burden should be assigned in proportion to the contribution to the situation (Friman and Strandberg, 2014; Truccone-Borgogno, 2023)². As developed countries have been responsible for about 75% of anthropogenic CO₂ emissions since the Industrial Revolution, this is a position that is massively defended by developing countries (Page, 2008)³. It is interesting to note that both the capacity principle and historical responsibility are defended in the 1992 United Nations Framework Convention on Climate Change, which states in its third article that nations should “protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities” (UNFCCC, 1992).

Likewise, market pricing is associated with the beneficiary pays principle, which holds that past pollution should be taken into account by considering the benefits derived from these activities (Page, 2008; Truccone-Borgogno, 2023). Contrary to historical responsibility, the objective is not to compensate past pollution per se, but to contribute to the cost of combating climatic issues in proportion to the enrichment derived from these damages – beneficiary pays is thus concerned with the effects rather than the causes of climatic issues (Page, 2008).

2 For an overview of the various operationalizations of historical responsibility, see Friman and Strandberg (2014).

3 It should be noted that historical responsibility is sometimes distinguished from polluter pays in that historical responsibility is specifically related to *past* emissions while polluter pays is associated with *current* emissions (Tørstad and Sælen, 2018).

Last, but not least, market pricing is also the ethical foundation for the current meaning of grandfathering. While grandfathering was originally defined as an exemption from a given regulation, the most common approach now holds that past emissions should determine the share of emissions actors are subsequently allowed to retain (Damon et al., 2020; Knight, 2013). Here, allocations are supposed to be proportional to historical emissions. Such an approach of grandfathering is a key equity principle behind emissions reductions of the 1997 Kyoto protocol, which posits that countries should reduce their greenhouse gas emissions considering 1990 emission levels as an historic baseline (Dooley et al., 2021; Knight, 2013). As it is particularly favourable to industrialized countries, this principle is highly criticized – and often considered as unfair⁴.

4. Conclusion: scientific and practical implications

The objective of this paper was to shed new light on climate equity principles by showing that they correspond to the four relational models previously identified by Fiske, and to their associated principles of distributive justice (Fiske, 1992, 1991). In doing so, we do not claim to offer a radical departure from existing understanding of equity principles. Rather, we hope to refine our comprehension of this topic by pointing out that, beyond the apparent diversity and complexity of these principles, a quite simple conceptual apparatus may suffice to describe their very nature.

Naturally, as the four relational models are often employed in combination to structure social life, so climate equity principles are also often regularly employed jointly to organise burden sharing: the idea is to overcome the shortcomings associated with the use of isolated principles (Dooley et al., 2021). For instance, the approach labelled equal cumulative per capita emissions is a combination of proportionality and equality, as climate burden will be first distributed in proportion to past emissions for a given period of time and then assigned on an equal-per-capita basis (Höhne et al., 2014). Similarly, various staged approaches have been proposed by which developing

⁴ For a nuanced presentation of the current meaning of grandfathering, see Damon et al. (2020) and Knight (2013).

countries start with few restrictions following a need-based approach, and then progressively get burdens in proportion to their increasing economic resources and emissions (Baer, 2013).

We conclude here by highlighting both the scientific and the practical implications of such a clarification of climate equity principles.

4.1. Scientific implications

As recently highlighted, many studies examining climate efforts pretend to be value-neutral and fail to clarify the ethical choices behind their indicators (Dooley et al., 2021; Rivadeneira and Carton, 2022). Such a practice induces a sense of objectivity and effort-sharing practices are thus presented as inherently fair. Yet, climate equity principles are always based on normative assumptions that need to be clarified.

By unveiling the ethical foundations of climate equity principles and by classifying these principles, this paper may enable the development of more transparent studies of climate efforts. In particular, integrated assessment models that are currently employed to quantitatively evaluate the impact of policies on decarbonization trajectories could be refined with a more explicit consideration of climate equity principles (Rivadeneira and Carton, 2022). The framework we propose may also favour more critical scholarly engagements with ethical choices that are made by the various actors concerned with climatic issues, as recently requested by some authors (Dooley et al., 2021; Tilsted et al., 2023). For instance, this framework may be employed to challenge the apolitical depiction of climate efforts that is employed by the Science-based targets initiative, which helps companies set climate targets in line with the Paris agreement and which has recently been criticized for obscuring the politics embedded within these targets (Tilsted et al., 2023).

4.2. Practical implications

From a practical standpoint, inequity in burden sharing is known to be a key factor in explaining the failure to bend the global emissions curve, as it undermines trust required for successful climate negotiations and for the execution of subsequent actions (Dooley et al., 2021; Stoddard et al., 2021). As a consequence, the concrete implications of our analysis are twofold.

On the one hand, by organizing information on equity, the framework we propose may facilitate the definition of climate efforts (Markkanen and Anger-Kraavi, 2019; Ringius et al., 2002; Tørstad and Sælen, 2018). Since the 2015 Paris agreement, countries have to propose voluntary intended nationally determined contributions every five years and to explain how fair these contributions are. However, to date, information on equity provided by each country has not been precisely structured, rendering their efforts difficult to assess and to compare (Pauw and Klein, 2020; Sælen et al., 2019; Winkler et al., 2018). Similarly, companies are increasingly asked to set climate targets in order to reduce the environmental impact of their activities. Yet, the methodological choices they make are not always publicly available (Giesekam et al., 2021; Tilsted et al., 2023). We think that the conceptual framework we propose to adopt in this paper – and, in particular, the distinction between need, position, equality and proportion – may help parties clarify their position, identify compromises, and communicate very simply about the nature of their climate efforts which, by generating perception of fairness and mutual trust, may consequently encourage more ambitious actions.

On the other hand, the clarification of the ethical foundations of climate equity principles may ease the acceptance and, finally, the effective implementation of climate policies (Drews and Van den Bergh, 2016; Tørstad and Sælen, 2018). Even if the transition towards low-emissions economies is technically possible, the lack of public support is a major barrier to climate change adaptation and mitigation (Bernauer and McGrath, 2016). To gain such a support, perceived fairness is considered to be key: policies that are in line with citizens' values and beliefs are more easily accepted by populations (Drews and Van den Bergh, 2016). By simplifying the diffusion of climate

policies to this audience, we think that the framework we propose may also help securing their approval.

References

- Baer, H.A., Singer, M., 2018. *The Anthropology of Climate Change: An Integrated Critical Perspective*, 2nd ed. Routledge, London. <https://doi.org/10.4324/9781351273121>
- Baer, P., 2013. The greenhouse development rights framework for global burden sharing: reflection on principles and prospects. *Wiley Interdisciplinary Reviews: Climate Change* 4, 61–71.
- Bernauer, T., McGrath, L.F., 2016. Simple reframing unlikely to boost public support for climate policy. *Nature Climate Change* 6, 680–683.
- Crate, S.A., 2011. Climate and culture: anthropology in the era of contemporary climate change. *Annual review of Anthropology* 40, 175–194.
- Crate, S.A., Nuttall, M. (Eds.), 2016. *Anthropology and Climate Change: From Encounters to Actions*. Routledge, New York. <https://doi.org/10.4324/9781315434773>
- Damon, M., Cole, D.H., Ostrom, E., Sterner, T., 2020. Grandfathering: environmental uses and impacts. *Review of Environmental Economics and Policy* 13, 23–42.
- Davidson, M.D., 2021. How Fairness Principles in the Climate Debate Relate to Theories of Distributive Justice. *Sustainability* 13, 7302.
- Dooley, K., Holz, C., Kartha, S., Klinsky, S., Roberts, J.T., Shue, H., Winkler, H., Athanasiou, T., Caney, S., Cripps, E., 2021. Ethical choices behind quantifications of fair contributions under the Paris Agreement. *Nature Climate Change* 11, 300–305.
- Drews, S., Van den Bergh, J.C., 2016. What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy* 16, 855–876.
- Fiske, A.P., 2004. Relational models theory 2.0, in: *Relational Models Theory: A Contemporary Overview*. Lawrence Erlbaum Associates Publishers, Mahwah, NJ, US, pp. 3–25.
- Fiske, A.P., 1992. The four elementary forms of sociality: framework for a unified theory of social relations. *Psychological review* 99, 689.
- Fiske, A.P., 1991. *Structures of social life: The four elementary forms of human relations: Communal sharing, authority ranking, equality matching, market pricing*. Free Press.
- Frey, U.J., Burgess, J., 2022. Why do climate change negotiations stall? Scientific evidence and solutions for some structural problems. *Global Discourse* 1–25.
- Friman, M., Strandberg, G., 2014. Historical responsibility for climate change: science and the science–policy interface. *Wiley Interdisciplinary Reviews: Climate Change* 5, 297–316.
- Giesekam, J., Norman, J., Garvey, A., Betts-Davies, S., 2021. Science-based targets: on target? *Sustainability* 13, 1657.
- Grecksch, K., Klöck, C., 2020. Access and allocation in climate change adaptation. *International Environmental Agreements: Politics, Law and Economics* 20, 271–286.
- Haslam, N., 2004. *Relational models theory: A contemporary overview*. Psychology Press.
- Höhne, N., Den Elzen, M., Escalante, D., 2014. Regional GHG reduction targets based on effort sharing: a comparison of studies. *Climate Policy* 14, 122–147.
- Klinsky, S., Roberts, T., Huq, S., Okereke, C., Newell, P., Dauvergne, P., O’Brien, K., Schroeder, H., Tschakert, P., Clapp, J., 2017. Why equity is fundamental in climate change policy research. *Global Environmental Change* 44, 170–173.
- Knight, C., 2013. What is grandfathering? *Environmental Politics* 22, 410–427.
- Levinson, A., 1999. Grandfather regulations, new source bias, and state air toxics regulations. *Ecological Economics* 28, 299–311.
- Markkanen, S., Anger-Kraavi, A., 2019. Social impacts of climate change mitigation policies and their implications for inequality. *Climate Policy* 19, 827–844.
- Mattoo, A., Subramanian, A., 2012. Equity in climate change: an analytical review. *World Development* 40, 1083–1097.

- Nash, J.R., Revesz, R.L., 2007. Grandfathering and environmental regulation: the law and economics of new source review. *Nw. UL Rev.* 101, 1677.
- O'Reilly, J., Isenhour, C., McElwee, P., Orlove, B., 2020. Climate change: Expanding anthropological possibilities. *Annual Review of Anthropology* 49, 13–29.
- Page, E.A., 2008. Distributing the burdens of climate change. *Environmental Politics* 17, 556–575.
- Pauw, W.P., Klein, R.J., 2020. Beyond ambition: increasing the transparency, coherence and implementability of Nationally Determined Contributions. *Climate Policy* 20, 405–414.
- Pottier, A., Méjean, A., Godard, O., Hourcade, J.-C., 2017. A survey of global climate justice: from negotiation stances to moral stakes and back. *International Review of Environmental and Resource Economics* 11, 1–53.
- Powers, K.E., Kertzer, J.D., Brooks, D.J., Brooks, S.G., 2022. What's fair in international politics? Equity, equality, and foreign policy attitudes. *Journal of Conflict Resolution* 66, 217–245.
- Rajamani, L., 2008. From Berlin to Bali and Beyond: Killing Kyoto Softly? *International & Comparative Law Quarterly* 57, 909–939.
- Ringius, L., Torvanger, A., Underdal, A., 2002. Burden sharing and fairness principles in international climate policy. *International Environmental Agreements* 2, 1–22.
- Rivadeneira, N.R., Carton, W., 2022. (In) justice in modelled climate futures: A review of integrated assessment modelling critiques through a justice lens. *Energy Research & Social Science* 92, 102781.
- Robertson, H.G., 1995. If Your Grandfather Could Pollute, So Can You: Environmental Grandfather Clauses and Their Role in Environmental Inequality. *Cath. UL Rev.* 45, 131.
- Ryberg, M.W., Andersen, M.M., Owsianiak, M., Hauschild, M.Z., 2020. Downscaling the planetary boundaries in absolute environmental sustainability assessments—A review. *Journal of cleaner production* 276, 123287.
- Sælen, H., Tørstad, V., Holz, C., Nielsen, T.D., 2019. Fairness conceptions and self-determined mitigation ambition under the Paris Agreement: Is there a relationship? *Environmental science & policy* 101, 245–254.
- Shields, L., 2020. Sufficiencyarianism. *Philosophy Compass* 15, 1–10.
- Shue, H., 2019. Subsistence protection and mitigation ambition: Necessities, economic and climatic. *The British Journal of Politics and International Relations* 21, 251–262.
- Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G.P., Sokona, Y., Stirling, A., Stilwell, M., Spash, C.L., Williams, M., 2021. Three decades of climate mitigation: why haven't we bent the global emissions curve? *Annual Review of Environment and Resources* 46, 653–689.
- Tilsted, J.P., Palm, E., Bjørn, A., Lund, J.F., 2023. Corporate climate futures in the making: Why we need research on the politics of Science-Based Targets. *Energy Research & Social Science* 103, 103229.
- Torpman, O., 2021. Isolationism and the equal per capita view. *Environmental Politics* 30, 357–375.
- Tørstad, V., Sælen, H., 2018. Fairness in the climate negotiations: what explains variation in parties' expressed conceptions? *Climate Policy* 18, 642–654.
- Truccone-Borgogno, S., 2023. Climate Justice and the Duty of Restitution. *Moral Philosophy and Politics* 10, 203–224.
- UNFCCC, 2015. Paris agreement.
- UNFCCC, 1992. United Nations Framework Convention on Climate Change.
- Vodosek, M., 2015. Relational Models Theory. *Wiley Encyclopedia of Management* 1–3.
- Winkler, H., Höhne, N., Cunliffe, G., Kuramochi, T., April, A., de Villafranca Casas, M.J., 2018. Countries start to explain how their climate contributions are fair: more rigour needed. *International environmental agreements: Politics, law and economics* 18, 99–115.

Table 1. Relational models and climate equity principles

Relational model	Nature of relationships within groups	Principle of distributive justice	Corresponding general climate equity principle	Key examples
Communal sharing	Members of a group are not differentiated from each other	To each according to his needs	Climate burden should be shared according to needs	- Need
Authority ranking	Members of a group are differentiated according to some social dimensions	To each according to his position	Climate burden should be shared according to positions	- Grandfathering (original meaning) - Sufficientarianism
Equality matching	Members of a group are treated as equals	To each the same	Climate burden should be shared equally	- Equal per capita - Cost-effectiveness
Market pricing	Members of a group are treated according to ratios	To each in due proportion	Climate burden should be shared proportionally	- Capacity (or ability to pay) - Historical responsibility (or polluter pays) - Beneficiary pays - Grandfathering (current common meaning)