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SYMPOSIUM ARTICLE

Conceptually Distinguishing Climate Mitigation, Adaptation, and Loss & Damage

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Abstract
Loss & Damage involves the impacts of climate change that are beyond our ability to adapt. Losses and damages are those relevant impacts. That distinction is less commonly applied to adaptation and mitigation such that the impacts that are "adaptable" are beyond limits to mitigation. This article points out that these conceptual distinctions mean impacts should be indexed to (a) the time of evaluation (what is currently adaptable might not be in the future) and (b) the capacities of the society (abilities to adapt and mitigate are relative to capacities). Implications are drawn about responsibility based on these twin indices.

Keywords: adaptation; climate change; climate ethics; climate justice; mitigation; Loss & Damage

1. Introduction

The United Nations Framework Convention on Climate Change's 27th Conference of the Parties ended with the bad news that mitigation efforts did not increase and the good news that a funding mechanism for Loss & Damage (L&D) policies (including, but not limited to, compensation) was agreed upon. There are a variety of philosophers who have discussed the ethics of L&D (e.g., Boran, 2017; Draper, 2025; García-Portela, 2018, 2025a; McShane, 2017; Mintz-Woo, 2025; Truccone, 2025; Wallimann-Helmer, 2015; Zellentin, 2025). However, while L&D ethics have been discussed extensively (Düvel & García-Portela, 2024), it seems few have tackled, conceptually, what L&D *is*—and how it differs from mitigation and adaptation.[1] I believe that careful consideration of the differences between these categories will have implications for responsibility for them. However, I also think it is of independent conceptual interest to distinguish them. Is there a robust conceptual difference between them?

There are several relevant questions here. First, how does L&D differ from adaptation? (Analogously, how does adaptation differ from mitigation?) Second, what is the relationship between L&D (measures and policies) and the losses and damages (impacts, events or outcomes) that L&D responds to? Finally, are there different duties that apply to L&D compared to adaptation and mitigation? I believe that the answers to these questions could help inspire more careful and subtle claims about responsibility and duty-bearers.

Furthermore, there is both policy and conceptual need for such work. With respect to policy, the size of the demand is very sizeable; Tavoni et al. (2024) estimate L&D funding needs at $395bn USD

[1]Two key exceptions to this generalization are Laura García-Portela and Idil Boran, who I discuss and contrast with my account in Sections 2 and 3.c, respectively.

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for the year 2025. We can only expect that to grow over time as climate change worsens. Furthermore, this is a hinge point, with the aforementioned agreement on a L&D fund, albeit with limited guidance about how to apportion or distribute these funds in a justified manner. Conceptually, philosophical understanding of these differences between these categories is, at minimum, a way philosophy can support the scientific research (Serdeczny, 2019). More importantly, however, the approach that this article takes helps draw attention to some interesting normative questions about causes and effects which are spread out over space and time, since that means that they allow for the possibility of intervening agents, which complicates responsibility.

The key conceptual points reflect the ways that the status of a particular climate impact is not fixed. First, the level of threat and the capacity to respond to these impacts vary over time as the climate threat develops. Second, the status of the impact varies according to the capacities of the actors involved. It follows that which measures or policies are appropriately counted as mitigation, adaptation, or L&D is similarly dependent.

A particular climate impact[2] (e.g., an urban heatwave at a particular time at a particular place with a particular level of intensity) has a complicated history. At first, some sufficient level of emissions is reached such that the requisite level of heat energy is collected. The weather patterns are such that this heat will manifest in a heatwave (for instance, there are blocking events which hold the pressure fronts in the right way). Before all of the appropriate conditions are met, "mitigation" measures might prevent this climate impact from developing by reducing the energy in the climate system (addressing the climate *hazard*, or the climate event that risks generating an impact). After these conditions are met, the heat wave is "baked in" (no pun intended). However, depending on the capacities of the urban area, perhaps the threat can be ameliorated by reducing *vulnerability* (the level of harm that would accrue to a population if a hazard occurred, e.g., by increasing cooling and shady areas) or *exposure* (the size of the populations potentially exposed to a given hazard, e.g., by moving some population away from the impact). These measures which reduce vulnerability and exposure, thus constitute "adaptation" measures. Finally, to the extent that we cannot reduce vulnerability or exposure (e.g., due to financial or technological feasibility constraints), we are left with impacts that we can only give ex post relief (e.g., through insurance payouts or other transfers —note that although these give relief ex post, they do not need to be *set up* ex post).[3] The measures that contribute to such relief we call "Loss & Damage" (L&D).[4] The three kinds of policies and measures—mitigation, adaptation, and L&D—we jointly call the three "pillars of climate policy."

In Section 2, I discuss ways that pillars of climate policy have been addressed in the literature before defending a particular way of distinguishing them based on an analogy of the boulder on the ledge. In Section 3, I draw out some normative conclusions from claims about causal responsibility. The account I defend here draws attention to questions that are often obscured—namely, about how responsibility shifts as emissions cause impacts to shift from one category to another. Finally, Section 4 concludes with a summary of the work done.

2. Pillars of Climate Action

Before introducing my own way of linking these three pillars of climate action (mitigation, adaptation, and L&D), it is worth reviewing some conventional ways the climate policy community makes these distinctions. The first is in terms of the intentions or subjective states of the actors; the second is in

[2]In the IPCC terminology, a climate "impact" is roughly synonymous with a climate "outcome" or "consequence." Following their terminology, I use these interchangeably.

[3]This is sometimes called the "beyond adaptation" or "limits to adaptation" interpretation of L&D, but the term has many other uses in different debates and is highly contested (Boyd et al., 2017). I adopt this usage here because it makes it possible to delineate between adaptation and L&D and because I take it to be closer to the policy understanding.

[4]This article adopts the convention of capitalizing the policy term "L&D" while using lowercase "losses and damages" for the impacts themselves (Mechler et al., 2019).

terms of the preferences or subjective states of those at risk. A third common response is that there is no robust distinction between these pillars. I object to each of these three responses before turning to my own way of distinguishing these.

First, we can distinguish the pillars by *reference to the actors' subjective states*: for instance, if one's intention is to sequester carbon in the soil when planting, we might call that planting behavior "mitigation." A legal scholar, for instance, might indicate that whether a measure is adaptation or L&D depends on the goals of the planner (Lees, 2017).

However, intentions are often mixed and opaque, both from first-person and third-person perspectives, making it difficult to generate conceptually robust distinctions between these pillars. For instance, offsetting is highly controversial (despite support from some climate ethics scholars [Broome, 2012]), but what most agree to be morally relevant is whether the offsetting generates *actual* mitigation, not what is *intended* by offsetters (this is the issue of "additionality" [Hyams & Fawcett, 2013]).

Second, instead of referring to the motivations of the actor or planner, we could distinguish the pillars with *reference to subjective preferences of those affected*, e.g., taking adaptation to cover measures for which risks are perceived as acceptable or tolerable, whereas L&D applies to risks which are taken to be intolerable. On this view, which is influential both in the technical climate literature and among some climate philosophers, there is no difference among these different categories independent of the subjective judgments of those at risk.[5]

However, conceptually speaking, if these pillars are dependent on subjective preferences, then they are not sufficiently robust to differences in opinion and intrasocietal disagreements about risk, which of course may be driven by misunderstanding of the actual facts (McShane, 2017). It is well-known in the social psychology literature that people have a very difficult time judging risk, and climate risks are especially challenging to understand given the long time frames and complex causal patterns (Marshall, 2014).

Finally, if we do not consult the intentions of the actor, or the judgments of those affected, we could throw up our hands and say there is *no robust distinction* between these impacts: there are only various measures we can take to address climate change, and it is helpful to view some of them under one pillar or another. An economist might say, for instance, that some measures might be adopted as adaptation simply in virtue of the fact that those measures *will be taken* (since they are cost-effective) while the residual risks that are not addressed by those measures become losses and damages due to the limits on the adaptive measures adopted (Mechler & Schinko, 2016). On this view, there is no theoretical distinction between categories, but there might be practical or contingent differences that result in actions being taken or not taken (e.g., due to applicable cost–benefit analyses).

Taking this view would also be conceptually unsatisfying, however, as it would be advantageous to understand these distinctions in a conceptually robust way. In this context, robustness roughly corresponds with value-freedom, in the sense that what counts as mitigable, adaptable, or losses and damages is insensitive to the preferences of any actors involved. Instead, it depends on a mix of natural facts: physical facts about the climate system and social facts about the limitations of mitigation and adaptation potential. Another concern with the no robust distinction approach is that it fails to be action-guiding, since one of the substantive issues is how to choose among different pillars of climate action, or to assign responsibility for them, issues this alternative would lack the resources to answer.

I believe these failures motivate developing an account that is sufficiently conceptually robust. In particular, the desideratum for the account is that categorizing which impacts fit under which pillar should not simply be a matter of polling populations. In other words, I am adopting something like

[5]For instance, following Dow et al. (2013), Wallimann-Helmer (2016) adopts this view. Versions of this view could fit under the "Adaptation and Mitigation" and "Risk Management" approaches to Loss & Damage discussed by Boyd et al. (2017).

an implicit commitment argument for the distinction I defend: the policy discourse is committed to a robust distinction between mitigation, adaptation, and L&D. Insofar as that is the case, if an account fails to generate a sufficiently robust distinction between these pillars, then rejecting the account is justified. In short, our prior commitment to the distinction justifies our acceptance of the strongest theory of the distinction. A closely related, but more conciliatory, way of considering these definitions is conditional: supposing that we distinguished between the pillars in this way, is there a consistent and methodologically robust way the distinction could be made?[6]

One preliminary point to reiterate is that my account builds on something that I take to be completely accurate in the extant literature: the distinction between *hazard* (i.e., the threatening physical climate events), *vulnerability* (e.g., the level of harm that would accrue to a population if a hazard occurred), and *exposure* (e.g., the size of the populations that are potentially subject to the hazard). What I add to this is the connection between mitigation, adaptation, and L&D; a systematization of the distinctions between these policies and their impacts; and an emphasis on the conditions needed to distinguish these three categories. With this structure, we have what I would call a "robust account" of climate impacts.

The first thing that is needed for my robust account of climate impacts (impacts which are *mitigable*, *adaptable*, and *losses and damages*) is *limits to mitigation* and *limits to adaptation*. In order to delineate the impacts that fit into one of these categories, we need to know the measures that separate these categories. Such limits are usually discussed in terms of feasibility, but in principle other kinds of modality could do the necessary work. In each case, we may consider hard or soft (as well as hard*er* and soft*er*) limits, depending on what type of feasibility is in question. Generally speaking, the hard limits are technological or physical constraints, whereas soft limits add social and political constraints (Dow et al., 2013; Mechler & Schinko, 2016; Wallimann-Helmer, 2015). In other words, there is a hard limit to mitigation if it requires technology that is physically impossible (to our knowledge at a current state); there is a soft limit if it requires funding that is socially or politically impossible to mobilize.[7] As a corollary, any categorization of impacts into the three pillars is dependent on these limits (and to the social and technological facts that constitute these limits).

The second thing that is needed, which follows from the first, is that where these limits apply is temporally contingent. That is because both hard and soft limits vary over time. This is most obvious with hard limits, since technological progress means that engineering and physical capacities tend to increase over time, but it is also true with soft limits, perhaps because people will countenance more aggressive action at later times once they experience some climate impacts.

It follows that which impacts are mitigable, adaptable, or losses and damages is indexed to a time and a set of limits.[8] That indexing can be implicit or explicit (although it is usually implicit) and can be set in any number of ways—I would suggest that familiar Gricean maxims and appeals to conversational implicature seem appropriate. Once we have these indices, it is an empirical fact to

[6]Of course, one possibility is that the implications I draw from my account lead some to reject (a) a robust account or (b) the distinction itself—my modus ponens might, for some, be a modus tollens. While obviously I take my case to be a ponens, establishing these interesting implications is more important for me than adjudicating which conclusions to draw.

[7]Note that "feasibility" comes in different forms: in the scientific literature, two salient types of limits between adaptation and L&D are "hard" and "soft" limits to adaptation. Interestingly, the conclusions that I draw are dependent on which limits to adaptation we adopt, due to the fact that in the technical literature, soft limits are usually construed as local or regionally determined (e.g., what political will is feasible at a time in a given region) whereas hard limits are usually construed as global (e.g., what technology is feasible at a time internationally). If we are adopting soft limits, for the account to be robust, we have to assume that there are (social) facts about what these limits allow for. Although scholars like Roser (2015) are skeptical that there are real limits to feasibility, I believe that there are such limits and we can know about them, at least approximately. For instance, it is politically and economically feasible to spend *some* resources to protect against flooding in most contexts; in contrast, it is politically and economically infeasible to spend *all* resources to protect against flooding in most contexts. Then determining where the feasible becomes infeasible in a given context involves reducing these bounds of uncertainty.

[8]This account aligns with the "Limits to Adaptation," and potentially to the "Existential," accounts of Loss & Damage in the typology of Boyd et al. (2017).

which climate pillar a given climate impact belongs: which impacts is a given climate measure addressing? If predominantly (or exclusively) mitigable impacts, that measure is mitigation; if predominantly adaptable impacts, that measure is adaptation; if predominantly losses and damages, that measure is L&D.[9] Of course, this account does not presuppose that our current prediction abilities are invariably sufficient to determine the policy pillar for any given climate impact or measure.[10]

With that structure, we can give more explanation of how mitigation and adaptation differ from L&D. Mitigation efforts involve reduction of the hazard by reducing the climate drivers (i.e., the emissions in the system), adaptation involves reduction of the exposure or vulnerability (i.e., protecting entities from climatic effects, either by reducing the number of those potentially affected or the ways they would be affected) (Cardona et al., 2012). L&D addresses the risk when neither the hazard, the exposure, nor the vulnerability can be lessened, for instance by providing insurance against the risk should it eventuate in an impact.

All of this allows us to answer the initial question very concisely. We can connect those categories of climate action to the indices, where limits to mitigation govern what a particular group with particular capacities at a given time is capable of mitigating. That gives a robust class of impacts as "mitigable" (robust meaning that, with sufficient information, it would not require value judgments to determine which impacts count as mitigable). In the absence of sufficient mitigation, those impacts would become "adaptable," requiring reductions in vulnerability or exposure. It would similarly be robust which impacts would count as "adaptable." Finally, insufficient adaptation would lead those impacts to become losses and damages, requiring policies and mechanisms aimed at ex post support (i.e., L&D).

Although these categories are robust, they do depend on the time of evaluation and the societal limits. That means that they are indexed to social facts about what is socially and technologically feasible. The upshot is that, if provided this information, the classification does not depend on states of mind about, or attitudes toward, the potential impacts. I will next argue that this upshot has substantive and interesting implications for claims about justice and responsibility.

We can contrast this account with others in the literature. The most developed normative account of climate L&D comes from García-Portela (2018, 29). "Losses and damages," in her terminology, are "*at least* when climate change disrupts people's lives by pushing them below a sufficient standard in their opportunities to enjoy the central aspects of a dignified, flourishing life (or capabilities)," an account she calls the "minimal capability-based" account (also cf. García-Portela, 2025a). The main way that this account has an advantage over hers is that it unifies mitigation, adaptation and L&D into one coherent whole. Her account, in contrast, is less aimed at understanding these links than in explaining and justifying how one especially important and serious class of impacts is of great moral significance.

But there are also some substantive conceptual concerns one might have about her account. For instance, her use of "at least" and "minimal" makes a potential dilemma (Mintz-Woo, 2025). On the

[9]It is also worth noting that some measures may simultaneously be addressing a variety of such impacts. For instance, a measure may address previous or imminent and unavoidable impacts (making them L&D) while also preparing for future impacts (making them mitigation). What is important is that this account explains why: with respect to certain (past or imminent) impacts at a given time, this measure is addressing losses and damages (and is therefore L&D) while with respect to other (less imminent future) impacts, this measure is addressing mitigable impacts (and is therefore mitigation). In such circumstances, I am less concerned about the exact nomenclature and more concerned that we understand the dual character of these measures. (If pressed and *required* to categorize the measures in one category exclusively, I would point to which type of impacts are "predominantly" addressed by the measure.)

[10]In practical terms, attributing probabilistic responsibility (or not) for particular climate impacts due to significant changes in probability density functions is becoming easier. However, it is a relatively young area of climate science, which began with the theoretical contributions of Allen (2003). For an overview, see James et al. (2019). García-Portela (2025a) discusses some contrasts between probabilistic and storyline approaches, although discussing their relative merits goes beyond the scope of this discussion.

one hand, it might be that *some* impacts that do not push people below the threshold are also losses and damages. But then the account seems questionably incomplete: which impacts above the threshold count and which not, and does this make the count objectionably disjunctive?

On the other hand, it might be that these terms are misleading and that *no* impacts beyond the threshold count as losses and damages—but then there are practical and conceptual difficulties about those other impacts. Practically, it still seems like these impacts should be tackled with L&D *policies and measures.* For instance, payouts of insurance schemes—a central L&D policy—should not be dependent on whether climate change has resulted in these kinds of strong disruptions. This is partially because, practically, such sensitivity would be absurdly complex to instantiate but also partially because, conceptually, climate impacts which are less than critically harmful still seem to matter morally.[11]

In contrast, my robust account of climate impacts can be used to draw out the causal importance of historical emissions, but also allows us to focus on questions that are obscured when we consider these categories of impact in isolation, namely, how to attribute causal and task responsibility in contexts where these categories change? I turn to these questions in the next section. While my responses may be controversial, I believe the account is valuable partially by drawing attention to these subtle questions.

3. Causal Responsibility

Having distinguished the three pillars, we can see what claims for responsibility for some (historical) emissions would be. The type of responsibility at issue here is causal (or historical) responsibility (a type of backward-looking responsibility), the level or amount an entity (counterfactually) contributed to an actual or historical risk. This is not the only type of responsibility, of course—and it is deeply contested whether it is necessary or sufficient for "moral" or "blame responsibility," terms which refer to categories of responsibility that license certain moral emotions or responses (Hansson, 2022).

The reasons I discuss causal responsibility here are threefold: (1) In standard cases, causal responsibility is a precondition for moral responsibility; (2) Regardless of one's commitments about the relationship between different forms of responsibility, everyone agrees that causal responsibility is *a* morally relevant form of responsibility; and (3) Causal responsibility is most directly aligned with the form of discussion of historical responsibility relevant in the IPCC processes.[12] I believe that it is reasonable to conclude that causal responsibility is a ground for liability, but trying to establish this claim goes beyond the scope of this essay, so my claims are conditional on adopting this claim.

Now that we have determined why we are discussing causal responsibility, we can discuss how causal responsibility works in a particular instance. Consider some given unit of historical emissions, which may have, for instance, individuals, firms, or nations as its source. In the technical literature, this

[11]García-Portela (2025b) seems to adopt this disjunct, holding that, as a conceptual matter, the harms below the threshold are harms, but not those above. She suggests a reason to adopt this view: the non-identity problem precludes considering impacts above this threshold as harms (in the context of intertemporal and intergenerational climate impacts). I find this unconvincing on both conceptual and empirical grounds. On the one hand, the non-identity problem does not obviously distinguish between impacts above and below the threshold—it seems like it would be a problem for both or neither. On the other hand, while the standard philosophy framing of climate change is in terms of intertemporal and intergenerational impacts, there is a good case to be made that climate change is sufficiently far advanced that it should be taken to be an *intra*generational problem (Steel et al., 2024). If so, the non-identity problem is practically less relevant, if not irrelevant.

[12]It is also worth noting that this type of responsibility is neither unfair nor subject to excusable ignorance. It is not unfair because the parties paying are predominantly continuing collectives (e.g. public entities like states and private entities like firms), which retain obligations over time (Shue, 2021); it is not subject to excusable ignorance because the goal is not punishment but repair, which is appropriate for those causing the damage (this is also why I do not claim this is moral responsibility, but merely causal responsibility) (Tan, 2023). Shue (2021) concurs, writing that this is not an issue of retributive or compensatory justice.

is usually called a "pulse" of emissions. Now consider some arbitrary potential impact from climate change. Given a time of evaluation and some set of (harder or softer) limits, I will make some claims about the causal responsibility of the source of those emissions for that (arbitrary) climate impact. I will also indicate some implications of such causal responsibility in terms of what we can call "task responsibility," indicating the responsibility agents might have to perform certain actions (Hansson, 2022).

An analogy is useful to structure intuitions about the three pillars. Suppose we represent our given climate impact with a boulder that threatens to impact people in a ravine below.[13] An obvious distinction is between the cases where the boulder is on the hill (so without further prodding, will not fall) and cases where it is falling. A more fine-grained distinction is between cases where the boulder is falling, but there is sufficient time or readiness to evacuate people, build shelter, or deflect the boulder's path before it falls enough to be harmful, and cases where it is falling and it is already advanced enough that there is no way to avoid its path.

First, cases where the impact could be prevented through "mitigation," i.e., mitigable impacts, are meant to be compared to the situation in which the boulder is perched somewhere on the cliff. If we mitigated to our given mitigation limits, that boulder would stay there (and the associated climate hazard would not eventuate). Second, cases where the impact could be moderated through "adaptation," i.e., adaptable impacts, are meant to be compared with the boulder falling, but where there is time to protect the people in the ravine from harm. If we adapted within our given adaptation limits, that boulder would be harmlessly redirected or the population moved (and the associated vulnerability or exposure to the hazard would be reduced or eliminated). Finally, cases where the impact can neither be prevented nor moderated, i.e., "losses and damages," are meant to be compared with the boulder falling, but where it is too far advanced to prevent the future harms. This is analogous to the case where the associated hazard, vulnerability, and exposure cannot be addressed within the given limits, meaning that this climate impact will happen (although at the time of evaluation it may not have happened yet).

With this guiding analogy in hand, we can discuss case by case where a given impact is affected by a given unit of emissions (the analogue to pushing the boulder forward slightly).

3.a. Mitigable impacts

The first option is that the emissions increase the chance of the hazard occurring, but not sufficiently to change the status of that impact from mitigable. In the boulder analogy, this would mean pushing the boulder closer to the edge, but not yet to the edge.

Suppose we consider causation in terms of a straightforward counterfactual theory of causation, where one event causes another if, had the first event not occurred, the second event would not have occurred (Lewis, 1973). This is an influential, albeit simple, theory of causation.

In this case, given our limits to mitigation, we would not say that the emissions caused the impact to be mitigable or non-mitigable, because it would have been mitigable regardless. In the boulder analogy, it would have been on the ledge regardless of this push, just further from the edge.

What should we say about the causal responsibility for those emissions with respect to this impact? We can take *proportional* or *marginal* responses. Proportional respondents say that, if the impact occurs, those who contributed are causally responsible to the extent that they contributed.[14]

[13]Actual policies or measures will simultaneously be addressing a large set of risks or impacts (represented by a variety boulders in the analogy), with various different levels of advancement (different placement along the cliff), and perhaps threatening different groups at different spatiotemporal scales.

[14]In a different literature, Frowe (2019) and McMahan (2011) discuss whether proportionality in war is roughly dependent on the contribution of the individual or relevant to the overall magnitude of the harm generated, respectively. Frowe's position, whereby civilians may be liable to defensive harm proportionate to the overall harm as opposed to their marginal contribution, seems quite absurd if transposed directly to this context: no matter how small an individual's contribution to historical

Marginal respondents say that, if the impact occurs, only those who add the emissions that are finally sufficient for the impact are causally responsible. In the boulder analogy, should we hold all those who contributed to making it the case that the boulder fell off the ledge causally responsible (proportional)—or just the one who gave it the final push needed for it to start falling (marginal)? I believe the proportional response is more appropriate here, since the marginal contributor only had the (bad?) moral luck to contribute at the precise point that changed the fact about whether the hazard was preventable. If the emissions had occurred in a different order, more or less the same outcome would have occurred (in the boulder analogy, the boulder would be pushed the same distance no matter which permutation of the same pushes happened), and responsibility would be unaffected (Shue, 2015). So, causally speaking, what is important is each historical emitter's contributions, not the order. Since each contribution is a proportion of the overall result, causal responsibility should be viewed as proportional to the contributions. Another way of justifying the conclusion is saying that it would be unfair to hold (only) the marginal emitter responsible as opposed to the set of emitters (Shue, 2021). Notice that the theoretical proportional claim is buttressed by the practical or empirical challenge of attributing the marginal effect to a given pulse of historical emissions.

What is important from the point of view of the pillars of climate change is that the relevant pillar does not change in this context: that impact was mitigable (given the limits to mitigation) and remained mitigable (given the limits to mitigation) after the historical emissions pulse in question. While it might be slightly cheaper to mitigate or slightly easier to address, from the point of view of the pillar distinctions, nothing has changed. From this point of view, it seems that the historical emitters have no morally distinctive causal responsibility in this case, since they are not responsible for causing the impact to be in the mitigable category it is in.

Of course, similar conclusions apply *within* all three pillars. If a given impact and a given set of emissions are such that the emissions are not sufficient to push that impact from one category to another, from the point of view of the pillar distinctions, there is nothing morally distinctive to say about that historical emissions' contribution to that impact. This is not to say that additional pulses of emissions ("pushes") are morally neutral; it is to say that the pillar categories are very coarse-grained. Regardless, it is not always the case that emissions keep an impact within a given category, and here we can draw more morally substantive conclusions.

Another conclusion also applies across pillars. If one endorses a theory of fair shares (Blomfield, 2019), historical emitters may have *task* responsibility to offset or compensate if their emissions exceeded fair shares (it is possible that this also generates blame responsibility if they fail to enact their tasks). However, my purpose here is to focus on causal responsibility, so I set this issue aside. In short, my account is compatible with—but does not entail—the claim that historical emitters have task (and potentially blame) responsibility for exceeding fair shares.

3.b. Adaptable impacts

While, in some cases, emissions will not suffice to push an impact from mitigable to adaptable, in other cases they would suffice. In this latter set of cases, the emissions push the impact from mitigable to adaptable. In other words, the given historical emissions move the impact beyond the (given) limit to mitigation. In such cases, we may still be able to address the impact by reducing vulnerability or exposure; in short, by adapting. This transforms what was a mitigable impact into an adaptable impact.

Here, the historical emissions make a material difference at the level of the pillar distinctions, by causing the impact to go beyond our ability to mitigate. Since I adopt proportional causal

emissions, they are liable relative to the overall climate effect(s)? This is an indirect, and independent, way of supporting the proportional approach. I thank Ezekiel Vergara for suggesting this literature comparison.

responsibility, I think that the extra emissions pushed the impact into a new category, but the causal responsibility is joint among historical emitters in a proportional manner. In general, causal responsibility for an impact licenses task responsibility to redress that impact. So does that causal responsibility mean that the historical emitters are task responsible for the associated costs (e.g., adaptation costs)?

I believe that they are—but that it may be that they are not *solely* responsible. The basis for this claim is that there are actors which plausibly have *climate-independent duties* to contribute to adaptation. These climate-independent duties also ground task responsibility. By climate-independent duties, I mean that these duties hold regardless of the historical emissions these actors have produced. If such climate-independent duties do exist, then responsibility for addressing adaptable impacts may be shared. In contrast, I will argue below that *only* historically emitting actors are responsible for L&D, since by definition there are no actors that can intervene to prevent losses and damages by the time that impacts are losses and damages. This would indicate a morally relevant difference between L&D and adaptation, a difference which has not been identified in the literature.

Here are two defenses of climate-independent duties. Two actors who might have such duties are wealthy countries and the governments of climate-threatened regions themselves. Of course, to maintain my position, all that is required is a case that there is *some* such actor—not necessarily even the ones suggested here—and that this actor has *some* climate-independent duty to contribute.

In terms of wealthy countries, one ground for such duties draws on cosmopolitanism, the view in political philosophy that duties of justice are owed regardless of national citizenship (Beitz, 1979). As a matter of cosmopolitan distributive justice, we have argued that wealthy countries have duties to contribute technology or funding for adaptation to less wealthy nations (Meyer & Roser, 2010; Wallimann-Helmer et al., 2019). These duties would then not be derived from generation of the emissions associated with these impacts.[15]

These duties could thus be part of larger global distributive justice duties to aid development (Duus-Otterström & Jagers, 2012, 751). The IPCC found that part of the climate adaptation gap stems from a broader lack of international development aid; it claimed

> high agreement and robust evidence that high vulnerability and exposure [to climate impacts] are mainly an outcome of skewed development processes, including those associated with environmental mismanagement, demographic changes, rapid and unplanned urbanization, and the scarcity of livelihood options for the poor. (Cardona et al., 2012, 70)

Insofar as there are antecedent duties owed by wealthy countries to contribute to development—or to facilitating global distributive justice—some of the vulnerability and exposure resulting from an adaptation gap represents a failure to discharge those duties. Any of these lines of reasoning would justify burden-sharing for adaptation for wealthy countries, demonstrating shared responsibility for wealthy countries which cannot be evaded by claiming no relevant connection to the harm. This also suggests a rough metric for the level of shared moral responsibility; if there are such duties, then the level of shared moral responsibility correlates with the failure to contribute whichever financial costs the cosmopolitan duties require.

In terms of threatened regions, a second ground for climate-independent duties could be that the governments of these regions (whether larger entities like states or smaller ones like municipalities) themselves owe it to their citizens to contribute to the burdens involved in adaptation. For instance, Miller writes that we might have positive duties to "secure the basic rights of the people we are

[15]Note that my claim is not that, if emitters do not shoulder their fair burden for, say, adaptation, then other agents should step up or take up the slack as some theorists like Miller (2008) and Hohl and Roser (2011) argue. My claim is that there are climate-independent duties to contribute to adaptation; therefore, adaptation failures may involve some climate-independent culpability.

responsible for protecting," which plausibly includes the citizens that governments have jurisdiction over (Miller, 2007, 47f). These duties are weaker than negative duties to avoid harming the citizens, but I believe would be applicable in a context like this. The point is that it is plausible that, independent of their link to historical emissions, some may have (some, limited) duties to assist with adaptation which would help moderate adaptable impacts. To that extent, we can say that any adaptable impacts relative to a given time involves responsibility beyond only historical emitters, or that historical emitters have shared responsibility if insufficient adaptation is implemented.

3.c. Losses and damages

The final case is where the given emissions push an impact from being adaptable to being beyond the (given) limits to adaptation. That does not imply that we know where and when this will occur, merely that it is beyond our ability to prevent or moderate the impact since it is indeed a loss or damage. Once again, this means there is causal responsibility for making that impact a loss or damage. Once again, I believe that this causal responsibility is shared proportionately among historical emitters once an impact is (or will be) a loss or a damage. However, I believe losses and damages license stronger moral claims than for other cases, especially for certain kinds of losses and damages.

By the time some impact or risk has been pushed into the category of loss and damage, I want to defend the claim that there is an important causal asymmetry between the emitters and those who could intervene in terms of adaptation such that the emitters are more responsible than the (non-) adapters. The distinction is this: the counterfactual where the emitters (or their emissions) did not exist is morally distinct from a blameworthiness perspective from the counterfactual where those capable of adapting (whether climate-independent or not) did not exist. Suppose that there were no agents capable of intervening in terms of adaptive policies or actions. Then there would be no distinction between an adaptable impact and a loss or damage: once the emissions had pushed something beyond the limits to mitigation, that would be sufficient for those impacts to (eventually) occur (since no one could adapt to the associated hazards). In contrast, suppose that there were no emitters (or emissions). If my account is correct, there would still be climate-independent duties to protect citizens from extreme weather. But there would be no *climate-dependent* reasons to adapt. There are no reasons to address threats that have not been initiated. So, from the point of view of the emitters, it is morally lucky that there are agents in this counterfactual who could (or even should) engage in adaptation, but those agents would not have been pressed into (climate-dependent) service had they not emitted. The upshot is important, even though unrecognized in the literature: failure to adapt (in climate-dependent ways) would not have been blameworthy in a counterfactual where the emissions were absent; failure to mitigate would be blameworthy regardless of the presence of potential adaptation measures. In short, we can say that historical emitters have a more robust duty to mitigate; this justifies a stronger moral link from these emitters to L&D than to adaptation.

Note that this point is also robust to at least some other accounts of causation.[16] For instance, Salmon's causal process account draws a parallel asymmetry: there is causal information propagated by the initial emissions which can ultimately result in losses and damages (Salmon, 1994). By way of contrast, the failure of climate-independent duty-bearers to contribute to climate adaptation does not involve any causal information propagation (inaction does not causally propagate information). In short, there is an important causal asymmetry between, on the one hand, the relationship between emitters and L&D and, on the other hand, between emitters and adaptation—and this causal asymmetry is morally important.

[16]Thanks to Ewan Kingston for suggesting this additional line of reasoning.

In terms of the boulder example, we can consider some potential analogues. My view is that the pushers of the boulder over the edge have a much stronger link to the losses and damages (and causal responsibility attribution is hence more appropriate) than those who fail to sufficiently adapt (e.g., by diverting the boulder). Intuitively, if they had not pushed the boulder, there would be no need to move the ravine population, so failure to protect the population is objectionable, but it is some type of secondary failure, not a primary one.

We can also drill down into L&D to indicate the importance of unavoidable or unpreventable impacts. Sometimes, losses are distinguished from damages as irreparable and reparable impacts (Page & Heyward, 2017).[17] For instance, it may be a loss for an ancestral burial ground to be flooded (that particular ground and the particular bodies cannot be recreated) but a damage for a family home to be flooded (that particular home can be replaced with another that is functionally equivalent). Some theorists have illustrated this distinction by distinguishing between means displacement and ends displacement (Goodin, 1989). If compensation or reconstruction can allow you to achieve your same ends, then we have simple means-displacement (and the impact involves reparable damage), but if you would have to change your ends, then we have ends-displacement (and the impact is an irreparable loss) (Serdeczny, 2019). To illustrate, a new house will allow you to achieve the same ends as an old house, but a new burial ground will not allow you to achieve the same ends as a historical burial ground.

If a given impact is a loss, then not only are the given historical emissions sufficient to make it the case that the impact will occur (whether or not it has occurred), but its status as an irreparable loss means that no compensation can redress the harm. This might, for instance, call for recognition or other symbolic responses (García-Portela, 2019).

If the given impact is a damage, then in principle you can be made whole, e.g., with replacement of damaged goods or sufficient compensation (perhaps with sensitivity to various attendant harms [Herington, 2017]). Note that this does not imply that these measures or mechanisms must be set in place ex post (i.e., after the impact has occurred), but could be—and often should be—enacted ex ante (Wallimann-Helmer, 2015). The reason for this is that pre-emptive measures, such as introducing insurance policies, can be helpful for distributing risk and reducing the harms associated with putting people at risk in a cost-effective manner (Herington, 2017; Mintz-Woo, 2018).

Furthermore, losses and damages are often restricted to the impacts which are irreversible (Mace & Verheyen, 2016). For those losses and damages that are irreversible and that are caused to be losses and damages by the historical emissions in question, they will inevitably cause harm, and those harms cannot be undone afterwards. While this is often closely related to impacts that are irreparable (i.e., those for which the ends are displaced), they can come apart. For instance, it could be that an impact is irreparable, but reversible. For example, if a particular burial ground is flooded, there might be no compensation that could replace that burial ground, but perhaps the damage could be undone over time by lowering the groundwater table to such an extent that the burial ground is restored to its original condition. Notice that this flooding might still be a loss or damage if the impact is beyond the given capacity for adaptation.

However, regardless of whether we are talking about losses or damages, these impacts are caused to be in this category by the historical emissions in question. Thus, a special moral responsibility for the subsequent non-adaptability of those impacts is justifiable. That moral responsibility is, unlike the responsibility for addressing adaptation measures, unshared, because the kind of national or international duties discussed above do not apply at the time of evaluation— at that time, these impacts *will* become losses or damages, given the definition of those terms.

We can compare my claims with another claim in the literature. Boran (2017) argues that a more convincing response to historical contributions is to create social structures ("architecture") that

[17]Burkett (2014) uses the term "restoration" instead of the terms I favor, "reparable" or "reversible." I prefer the following terms because "restore" is ambiguous between "repair" or "reverse."

promote general social welfare (also cf. García-Portela, 2018 and Boran, 2018). The contribution of social and governmental decision-making to increased vulnerability and exposure is correctly noted by Boran. However, the account defended here does more than indicate that these impacts have some social causes: it indicates precisely where and to what extent these matter. In the cases where historical emissions push an impact from mitigable to adaptable, there might be national or international climate-independent duties to contribute to adaptation (alongside duties associated with historical emissions). However, this is *not* the case when historical emissions push an impact from adaptable to losses and damages, since these impacts require compensation or other actions. My claim is that which task responsibilities are appropriate depends on the causal structure of the situation.

3.d. Upshots and objections

If these claims are correct, then we can draw some conclusions. Assuming no exculpatory factors, historical emitters have (shared, proportional) causal responsibility for impacts being adaptable (as opposed to mitigable) and (unshared, proportional) causal responsibility for impacts being losses and damages (as opposed to adaptable). (When the emissions are insufficient to change the status of an impact, they have no causal responsibility—at this coarse-grained level.) This causal responsibility suggests task responsibilities. Task responsibilities for adaptation measures, including their costs, are the responsibility of the relevant historical emitters, shared with others who have climate-independent duties to contribute to adaptation. On the other hand, causal responsibility for losses and damages supports the conclusion that L&D measures, including their costs, are the unshared task responsibility of historical emitters.

One issue that has not been addressed here is what happens when there are limits of feasible mitigation and adaptation, but mitigation and adaptation are not pursued to their limits. In that case, responsibility for failing to mitigate or adapt to feasible levels will depend on what the reasons for failure are. This could involve a mix of citizen, private and public sector inaction. However, this contemporary distribution of moral responsibility is in principle independent of any causal responsibility associated with historical emissions. (It could be that the gap in action involves historical emitters, but the responsibility involved is task responsibility, not the causal responsibility associated with historical emissions. In other words, even when the same agents are task responsible and historically responsible, their failure to act might be due exclusively to their task responsibility and not to their historical responsibility.)

The distinctions between these three pillars lead to substantive claims about causal responsibility for losses and damages: causal responsibility for losses and damages is highest among the three pillars. This is because currently mitigable impacts are not caused to be mitigable by historical emissions (mitigable impacts would have been mitigable regardless of historical emissions); adaptable impacts are not entirely caused by historical emissions (some adaptation gaps are due to insufficient development adaptation and other duties to contribute to adaptation independent of climate responsibility); whereas losses and damages are caused by historical emissions to be losses and damages. This demonstrates that L&D is morally different from mitigation and adaptation in conceptually important ways.

Finally, I want to point to an implication of these distinctions that could be of practical value. Since (a) the distinction between L&D and adaptation depends on the feasible limits at a given point and (b) the historical emitters on this account have incentive to avoid impacts being classified as L&D (since these are unshared responsibilities), historical emitters have incentive to show that impacts lie within our mitigative or adaptive capacities. If we are considering soft limits to adaptation, i.e., limits with respect to political or economic considerations, historical emitters have incentives to show that we have the economic or political will to mitigate or adapt to given impacts. Among other things, that means showing that our policy, legal, and economic instruments are sufficiently powerful to address many impacts. If this is the case, then there is also an incentive to

strengthen these instruments, so they can address a broader variety of impacts. In short, this delineation of the three pillars should motivate historical emitters to contribute support for policies and instruments that allow for more ambitious mitigation and adaptation actions. This is a practically valuable implication of the proffered theory.

4. Conclusion

It is worth stepping back: while some may object to—or differ with respect to—my specific judgments about causal and task responsibility, the most important virtue of my account is that it highlights these issues in a way that has not been done before. For instance, the failure of a group to adapt, leading to an impact becoming a loss or a damage, is practically important, but to my knowledge no one has drawn attention to the general conceptual structure that links mitigation, adaptation, and L&D to limits and impacts.

This account also draws attention to the ways that thinking of a single set of aggregated climate costs obscures the differences between different kinds of climate action—actions which may involve different actors with different duties in light of their different contributions. This link from historical emitters to different climate duties draws attention to a variety of interesting and practically important moral conclusions.

Finally, I believe that this structure is very fertile and potentially could apply to all kinds of long-term impacts or delayed threats, with causal and task responsibility shifting depending on what measures might be appropriate for addressing those impacts at different points, raising interesting questions about the dynamics of responsibility.

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