

## Chapter 2

# The Ethical Challenges in the Context of Climate Loss and Damage



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**Abstract** This chapter lays out what we take to be the main types of justice and ethical challenges concerning those adverse effects of climate change leading to climate-related Loss and Damage (L&D). We argue that it is essential to clearly differentiate between the challenges concerning mitigation and adaptation and those ethical issues exclusively relevant for L&D in order to address the ethical aspects pertaining to L&D in international climate policy. First, we show that depending on how mitigation and adaptation are distinguished from L&D, the primary focus of policy measures and their ethical implications will vary. Second, we distinguish between a *distributive* justice framework and a *compensatory* justice scheme for delivering L&D measures. Third, in order to understand the differentiated remedial responsibilities concerning L&D, we categorise the measures and policy approaches available. Fourth, depending on the kind of L&D and which remedies are possible, we explain the difference between *remedial* and *outcome* responsibilities of different actors.

**Keywords** Loss and Damage · Justice · Responsibility · Compensation Liability · Distributive justice · Compensatory justice · Ethics

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## 2.1 Introduction

Debate in ethics concerning climate change has mainly investigated questions of how to deal with mitigation and adaptation. Much of the debate has been on climate justice asking how to distribute the benefits and burdens of mitigation and adaptation fairly; dealing with the rights of those facing the impacts of climate change; or discussing the individual moral duty to change lifestyles in order to contribute to climate protection. An important detail of this debate is that mitigation and adaptation are often discussed under one and the same heading. Potential differences between duties related to climate change mitigation and those of adaptation are rarely analysed. Research dealing with this distinction, however, shows that there are crucial differences between the ethical challenges of mitigation and those of adaptation (Jagers and Duus-Otterström 2008; Wallimann-Helmer 2015, 2016). We build on this distinction to discuss a further distinctive area of climate change research and policy: the adverse effects of climate change leading to climate related Loss and Damage (for short: L&D). As we argue and demonstrate throughout, in order to address the ethical aspects pertaining to L&D in international climate policy it is essential to clearly differentiate between the challenges concerning mitigation and adaptation and those ethical issues exclusively relevant for L&D.

This chapter lays out what we take to be the main ethical challenges concerning climate L&D. Building on this diagnosis, we develop criteria to categorise measures as being appropriate for dealing with L&D and analyse how the responsibilities coming with these measures must be distributed to be just. First, we show that depending on how mitigation and adaptation are distinguished from L&D, the primary focus of policy measures and their ethical implications will vary (2.2). Second, we distinguish between a *distributive* justice framework and a *compensatory* justice scheme for delivering L&D measures. We discuss some theoretical advantages of distributive justice frameworks, but do not decide the issue. One key advantage for a distributive justice approach is that it covers all L&D rather than only the fraction that is anthropogenically induced (2.3). Third, in order to understand the types of measures that these justice approaches could apply to, we analyse the appropriateness of different measures and policy approaches available (2.4). Fourth, depending on the kind of L&D and which remedies are possible, responsibilities of different actors are found to vary (2.5). In particular, we discuss the distinction between *remedial* responsibility and *outcome* responsibility. Overall, while our primary aim here is to map out the most important arguments and principles in climate ethics dealing with L&D, we also argue that the capacity to most efficiently and effectively contribute to even out undeserved harm from L&D is crucial. One of our suggestions is that it is the differentiated capacities of those able to support the ones in need of assistance that should matter the most when differentiating remedial responsibilities to tackle L&D.

## 2.2 Two Approaches to Distinguish Between Adaptation and L&D

Some argue that the three pillars of climate policy at the UNFCCC level are mitigation, adaptation, and L&D (see introduction by Mechler et al. 2018; chapter by Calliari et al. 2018). While mitigation can be distinguished from adaptation quite easily (mitigation involves reducing GHG emissions and enhancing sinks and reservoirs whereas adaptation involves the processes, practices, and structures to moderate potential negative impacts), L&D is more challenging to differentiate from adaptation. Nevertheless, we can adopt a standard definition which helps to separate the two: in a climate change context, L&D may refer to actions dealing with the residual, adverse impacts of climate change which remain after mitigation and adaptation measures have been adopted (Mace and Verheyen 2016). We call this the “beyond adaptation” approach. This is similar to what the parties to the UNFCCC acknowledge in Decision 2/CP.19 when they state that L&D “involves more than, that which can be reduced by adaptation” (UNFCCC 2014).

In the literature, an alternative approach to the distinction is that adaptation involves responses to keep risks within the range of tolerable risk whereas L&D involves responses to risks that cannot be kept within the range of tolerable risks and so become intolerable. This means that despite adaptation measures these risks exceed socially negotiated norms or values defining tolerability (Dow et al. 2013a, b; Wallimann-Helmer 2015; see chapter by Schinko et al. 2018). We call this the “risk tolerance” approach. Depending on which of these approaches is chosen, different kinds of responsibilities and measures will become the primary focus of policy. In the following, we first show why this is the case and then argue why in setting these priorities both approaches complement each other.

The question of which responsibilities and measures the “beyond adaptation” approach encompasses can be elaborated by considering whether the climate-related impacts *cannot* be avoided or *will not* be avoided in the future by mitigation or adaptation (Mace and Verheyen 2016). In the literature, this same distinction has also been discussed in terms of *unavoidable* and *unavoided* impacts (Roderick and Verheyen 2008). According to this approach, a key reason why some adaptation measures that could have been taken will not be taken is that actors may be subject to socio-economic constraints. Typically, L&D measures are not taken due to a lack of international financing, implementation restrictions, or political constraints leading to soft and hard limits (Chambwera and Mohammed 2014). The Intergovernmental Panel on Climate Change (IPCC) sees soft limits if adaptation constraints can in principle be overcome in contrast to hard adaptation limits, where constraints lead to limits that cannot be overcome (Klein et al. 2014).

To illustrate this, imagine a scenario in which members of the Alliance of Small Island States (AOSIS), without international financing, may be unable to afford large-scale beach renourishment needed to guard against the impacts of high sea level rise. In turn, such adaptation would be taken were there sufficient financial (or other) resources available. The impacts associated with the inability to conduct such

large-scale beach renourishment can be considered losses and damages that *will not* be avoided. But it does not fall within the category of hard adaptation limits: impacts that *cannot* be avoided. Impacts that *cannot* be avoided are losses and damages that will materialize whatever measures are taken to adapt. For instance, AOSIS groups relocating due to sea-level rise that leads to loss of their homelands and damages to many of their valued assets (see chapters by Handmer and Nalau 2018; Heslin 2018). These losses and damages, which comprise market and non-market values, cannot be avoided by adapting to the new conditions regardless of the level of financial and other assistance.

This first “beyond adaptation” approach distinguishes L&D from adaptation by focusing on whether the different impacts can be avoided or will be avoided by appropriate measures without any assessment by those facing potential L&D. This is different from the “risk tolerance” approach. This second approach to distinguishing between adaptation and L&D focuses on how those facing the risks of L&D evaluate these risks. Risks of climate impacts that are judged to be intolerable are considered L&D and are contrasted with tolerable risks that are understood to be avoidable through adaptation (Dow et al. 2013a, b; Mechler and Schinko 2016; Wallimann-Helmer 2015). Such an evaluation of risks as intolerable, and thus relevant for L&D, presupposes value judgments that can only be taken by those facing those risks. Thus, according to the “risk tolerance” approach, it is crucial that those potentially facing climate impacts can assess the risks they are facing. Since different communities might assess similar risks differently, they will demand different measures that might fall within either the category of adaptation or L&D (see chapter by Schinko et al. 2018).

The “risk tolerance” approach primarily relies on the value judgments of those facing potential climate impacts. This not only shows why, according to this approach, the distinction between adaptation and L&D tends to be blurred. It also shows why it is most probably associated with a primary concern to foster appropriate structures and institutions for collective decision-making and capacity building within and among potentially impacted communities. The decisions regarding what measures should be taken, by whom and how they should be implemented are relegated to secondary importance. Thus, priorities regarding climate L&D tend to differ depending on the way of distinguishing adaptation from L&D (see Table 2.1). For the “beyond adaptation” approach, priority lies with fostering implementation of efficient and effective L&D measures, i.e. measures not being prone to soft and hard adaptation limits. For the “risk tolerance” approach, in contrast, priority lies with supporting capacity building in order for communities facing climate impacts to be better able to collectively assess the risks they face.

Thus, while the first approach to distinguishing adaptation and L&D mainly focuses on the impacts and the measures they demand to differentiate responsibilities, the second approach primarily derives the responsibilities to be differentiated from whether and to what extent capacity building is necessary. On the “risk tolerance” approach, although support for implementing L&D measures is of secondary concern, it may in fact be more effective for support to be provided if needed. As suggested by adaptation research, implementation of L&D measures is likely to be

**Table 2.1** Difference in policy priority depending on how adaptation and L&D are distinguished

	Beyond adaptation	Risk tolerance
1st policy priority	Implementing the most efficient and effective measures to deal with unavoided and unavoidable L&D	Fostering collective decision-making and capacity building to assess climate risks as acceptable, tolerable or intolerable
2nd policy priority	Involving local communities to secure efficient and effective implementation of measures to be taken	Implementing those measures understood to be most efficient and effective to deal with the threats as evaluated

more effective and efficient if accompanied by capacity building and involvement of local communities in decisions and management (cf. Kaswan 2016). Responsibilities for capacity building and fostering involvement thus also follow as important concerns when distributing responsibilities from the “beyond adaptation” perspective to distinguish adaptation and L&D. Even though the two approaches to distinguish adaptation and L&D tend to set different priorities, the foci they suggest regarding the measures to be taken complement each other.

This is so, because, regardless of the approach used to distinguish L&D from adaptation, in the end L&D concerns impacts that are in fact expected to materialise. Thus, L&D measures are expected to *respond to* or *minimise the socio-economic or human effects* of these impacts, but these measures are not expected to *prevent* these impacts altogether. In practical terms, they are expected to e.g. enhance transformative capacities to comprehensively deal with climate-related risks beyond traditional adaptation or to enhance trust and respect between countries facing L&D and those contributing to it.<sup>1</sup> Consequently, preventing climate impacts from materialising is a goal only to be ascribed to mitigation and adaptation—but not to L&D measures. There are a variety of measures which can be used to address L&D demanding different kinds of responsibilities, which we classify below (Sects. 2.3 and 2.4). Before it is possible to come to this classification, however, we must first be clearer about the nature of measures that can fall within the category of L&D. In this regard and as discussed below, paragraph 52 of decision 1/CP.21 accompanying the Paris agreement becomes highly relevant.

### 2.3 Neither Compensation Nor Liability Under the UNFCCC

When a damage or a loss occurs, it seems natural to ask who is liable for that harm and to demand repair or compensation of the damage or loss (Shue 1999, 2017). This is why the most natural way to investigate the ethical implications of

<sup>1</sup>For discussion of this latter point see Cohen (2016), O’Neill (2017), Thompson and Otto (2015).

L&D would be by considering *compensatory* or *rectificatory* justice. These kinds of justice considerations define the appropriate remedy for a damage or a loss. A classical compensatory principle, for example, demands that the victim is made whole again. The victims should find themselves in the same condition as they had been before infliction; to wit, as they would have been had the harm never occurred (Wallimann-Helmer 2015; Page and Heyward 2016). According to considerations of compensatory justice it is key to identify the inflictors contributing to the occurrence of harm, because, according to the most common understanding of compensation, those causing harm are seen as liable to make those they inflicted whole again. In terms of climate L&D, such a principle requires that those facing L&D should be made whole again by those liable for these harms. This is first and foremost the major greenhouse gas emitters who contribute or have contributed the most to climate change and in so doing to climate-related L&D.

Although such considerations of compensatory justice are plausible and important, in the following we argue that a different justice framing of how to consider the ethical implications of climate L&D must be considered alternatively or in conjunction with the intuitive compensatory view. This alternative framing is based on considerations of *distributive* justice. There are at least two reasons for considering this alternative framework. First, on pragmatic grounds in light of paragraph 52 of decision 1/CP.21 such an alternative framing may make acceptance of L&D measures among potential donor countries more feasible, at least under current political conditions. This is so, because decision 1/CP.21 makes explicit that “Article 8 of the [Paris] Agreement does not involve or provide a basis for any liability or compensation” (UNFCCC 2015).<sup>2</sup> Second, this alternative framing allows to fully capture the exigence of those actually facing L&D since it allows not only assignment of remedial responsibilities for anthropogenic climate L&D as is the case with compensatory claims but also responsibilities for L&D caused by natural climate variability (remedial responsibilities are discussed at greater length in 2.5). Compensatory justice is only owed for anthropogenic L&D because, conceptually speaking, those inflicting harm on others are only under a duty to compensate for the harms they cause while natural climate variation is not addressed. For the remainder of this section we elaborate on the differences between compensatory and distributive justice framings (see Table 2.2).

### *Compensatory Justice*

To better understand the differences in framing ethical implications of L&D in terms of distributive justice, it is helpful to clarify some issues in analysing these implications from the perspective of compensatory justice. We can distinguish several prominent and intuitively plausible principles to justify duties of compensation (cf. Gardiner et al. 2010). As already mentioned, in the case of L&D the most plausible responsibility bearer for compensatory duties is the emitter. The corresponding principle of justice is usually called the *Polluter Pays Principle* (PPP). A second prominent principle of justice to warrant compensatory duties identifies the benefi-

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<sup>2</sup>For other readings on the legal perspective see for example Lees (2016), Mayer (2017) and the chapter by Simlinger and Mayer (2018).

**Table 2.2** Overview of differences between analysing L&D within a framing of compensatory justice and distributive justice

	Compensatory justice	Distributive justice
Scope	Differentiating responsibilities in light of compensatory reasons and liability	L&D understood as undeserved harm demanding redistribution to even out this unfairness
Redistribution based on	Wrongful emitting	Undeserved harms
Temporal context	Backward-looking	Forward-looking
Implementation horizon	Long-term, once attribution challenges can be tackled	Short- to medium-term, while attribution challenges still exist and are a main barrier

ciary of emissions as responsible for providing compensation. This is the *Beneficiary Pays Principle* (BPP). In the literature, both principles most often identify individuals as responsibility bearers. But they can also refer to corporations or countries. This is why sometimes a third principle in some sense combining the first two is invoked. The *Community Pays Principle* (CoPP) ascribes the responsibility for compensation to the polluting and benefitting community. All three principles assign liability for compensation either to the polluters (PPP), the beneficiaries (BPP) or communities (CoPP).<sup>3</sup> They hold that by emitting, these differing agents acquire responsibility to make whole again those harmed by the consequences of their emissions. Thus, decision 1/CP.21 seems to suggest, these agents become liable to compensate for the L&D they are contributing to causing.

It is important to note that on ethical grounds compensatory duties for climate L&D are more difficult to justify than it at first appears. There are at least three basic problems for justifying compensation for L&D (Meyer and Roser 2010; Meyer 2013; Kolstad et al. 2015): a. Potential duty bearers might not have *wrongfully emitted* by exceeding their fair shares of emissions and thus have not acquired any legitimate compensatory duties; b. Potential duty bearers might have been (*blamelessly*) *ignorant* about the harmfulness of their emissions and can therefore not be said to be (fully) responsible to compensate; and c. Potential recipients might be said not to be *wrongfully harmed* since they are only wrongfully harmed if they are worse off due to (wrongful) emissions than they would otherwise be or if they fall below a specified threshold of harm due to (wrongful) emissions (or both).<sup>4</sup>

<sup>3</sup>Although we discuss these three principles as principles identifying the bearers of compensatory duties, these principles, and especially the beneficiary pays principle have also been shown to be important in identifying the bearers of duties of distributive justice (see Meyer and Sanklecha 2017).

<sup>4</sup>By such a threshold of harm, we mean that there is some sufficient (not necessarily minimal) level of well-being and any individual who falls below that is thereby harmed, regardless of the counterfactual arrangements (cf. Meyer 2003). In other words, individuals could be harmed by being below the threshold even if they had never had their interests thwarted by any other particular individual.

The challenges associated with identifying the legitimate agents to pay compensation and the legitimate claimants of compensation narrow down the number of potential recipients of compensatory payments. This number decreases even more when considering the conceptual challenge that strictly speaking compensation can only be demanded for anthropogenically induced L&D but not for natural climate variability (Huggel et al. 2016; Wallimann-Helmer 2015). Natural disasters without any human cause are tragic and individuals being threatened need to be assisted. However, this requirement of assistance can only be justified on humanitarian grounds and for reasons of distributive justice. They cannot be addressed by appeal to compensatory justice. This is why, in practice, compensatory claims for some specific (risk of) L&D demand the detection of anthropogenic cascades demonstrating why this L&D can be attributed to anthropogenic climate change (Huggel et al. 2013). Hence, the worry for the advocate of compensatory justice is that some victims of climate L&D might not be harmed in a normatively relevant sense, whereby considerations of compensation become unsuitable. Elaborating on these difficulties by considering individuals as duty bearers and claimants, it becomes possible that many emitters and legitimate claimants are not identified either as duty bearers or victims. Emitters only emitting within the limits of their fair shares cannot be identified as liable for compensation. Similarly, those individuals not wrongfully harmed, are not entitled to any compensatory payments. These reasons can be taken to be decisive against addressing L&D in terms of compensatory justice. However, considering the CoPP both these challenges must be qualified.

According to the assessments of the IPCC and the agreements under the UNFCCC countries, to wit communities, can definitively be identified as wrongful emitters not being legitimately excused by ignorance (Meyer and Sanklecha 2017). At least some agents of industrialised country parties (its citizens, companies or the countries as a whole) definitively exceed their fair shares of emissions (Shue 2017). Furthermore, with the publication of the first IPCC report it becomes difficult to argue for excusable ignorance from 1990 onwards. This suggests ways of how some of the challenges above can be met. However, even though industrialised countries and at least some of their companies can potentially be identified as duty bearers, the CoPP still only succeeds in justifying *some* compensation for L&D. As shown above, it can only justify them for *some* L&D from climate change but not for all since it only warrants payments for *anthropogenic* climate L&D but not for L&D caused by *natural* climate variability. To be clear, this is not necessarily a bad thing. Many developing countries facing climate L&D would already be much helped if they received some in contrast to no assistance. In addition, a compensatory approach can be said to be simple and more strongly in line with international law whereas distributive approaches are relatively untested in international fora. For instance, considering environmental issues in terms of reparations for injury has been dominant in legal history (the influential *Trail Smelter* case is based on “no harm” considerations, see Simlinger and Mayer 2018 for complexities in applying international environmental law to this issue).

Despite these pragmatic advantages, however, from an ethical point of view it seems highly problematic to only support those facing L&D in coping with part



of the harm they face. This is so for three reasons. First, the fact that the main L&D occurs in regions which historically have contributed far less to anthropogenic climate change seems to unfairly burden those least responsible for these adverse effects. Second, those regions and countries most burdened with L&D are often (economically) less well equipped to manage climate impacts once they materialise. Third and most importantly, since many adverse effects of climate change are not immediate but linked to slow onset events, it seems appropriate to say that in many regions of the world we find a situation of more or less acute emergency due to climate change already.<sup>5</sup> In our view, it seems clear that in a case of emergency, *someone* is under duty to assist irrespective of whether that agent has caused the threat (“remedial responsibility”). Such assistance usually is due up to the point where those under threat are safe again. Thus, it seems inappropriate to only help countries in need of assistance with L&D up to the point it can be attributed to anthropogenic climate change and then leave them on their own. That would be like helping someone drowning to as far to the shore as one has thrown him in, but then swim away. Rescuing someone drowning means to try one’s best to bring him safely to the shore irrespective of how much one contributed to the threat. Because of this, we believe that even in cases in which no one can be ascribed compensatory responsibility, all of those afflicted by climate L&D are entitled to assistance if they do not have the capacity to make themselves whole again. This especially applies to those who, due to climate L&D, fall below a specified threshold of harm.

### *Distributive Justice*

Especially to meet this last challenge, we suggest to also considering an alternative framing of the ethical implications of L&D, namely the framing of distributive justice. According to this alternative framing, rather than regarding L&D as reasons for compensation only, L&D also provides reasons for redistribution due to *undeserved harms*. That is, *wrongful emitting* would be relinquished as a relevant criterion to identify the duty bearers for payments in case of L&D. Instead, the focus would be on the *wrongfulness of harms* as defined from the perspective of distributive justice. In other words, the alternative framing to be considered demands redistribution in case of unfair disadvantage but not compensation due to wrongful emitting.

One way to distinguish between redistribution and compensation starts with the premise that there is some *baseline distribution* of goods or bads that is just. This baseline distribution is on the one hand determined by certain criteria or principles of justice (such as the priority view, the strict egalitarian view or any other) and on the other hand by legitimate changes to the distribution (as determined by criteria or principles of justice) which someone experiences as a result of her own *responsible (and non-wrongful) choices*. Deviations from this baseline then call for two different kinds of reactions. In case the reaction the deviation calls for is *based on the wrongfulness* of what occurred, we are operating in the realm of *compensatory justice*. In case the reaction the deviation calls for is based on the idea of *evening out undeserved* benefits or harms (which are due to bad luck, for example, or harmful

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<sup>5</sup>Notably we here understand climate change to encompass both anthropogenic climate change and natural climate variability.

but non-wrongful actions), we are operating in the realm of *distributive justice* since these undeserved benefits or harms demand redistribution (Meyer 2004; Meyer and Roser 2010). On the distributional justice approach in the case of L&D, the situation of communities, who just happen to have “bad luck” to be living in regions more heavily exposed to climate change, calls for an evening out of these undeserved harms.

Hence, if necessary to avoid political deadlock in light of decision 1/CP.21 and to secure assistance not only for the part of L&D that is anthropogenic, but for all L&D threatening countries and communities, one may speak in terms of *undeserved harms* rather than focusing on impacts brought about by wrongful emitters demanding compensation from those liable. Any responsibilities concerning L&D would then be understood as responsibilities that fall into the category of redistribution. In this manner, L&D-related responsibilities would be regarded as grounded in the objective of levelling undeserved harms. So, on the one hand, what could be looked for are ways of differentiating responsibilities without relying on the wrongfulness of emissions, liability and compensation. However, on the other hand, as attribution research matures and international climate policy develops, it may become more feasible to rely on causal explanations to help determine the differentiation of responsibilities in line with a compensatory approach (Boran and Heath 2016; Thompson and Otto 2015; see chapter by James et al. 2018), although doing so may be ambitious at this point (Huggel et al. 2013; James et al. 2014; Huggel et al. 2016).<sup>6</sup>

## 2.4 Categorising L&D Measures to Differentiate Responsibilities

The previous section leads to an important ethical consideration. Irrespective of the justice framework applied, the fact that developing countries carry such a large share of L&D cries out for *some* kind of response. Such a response makes it necessary to clarify two issues. On the one hand, it is necessary to be clear about what kinds of L&D can become relevant since these determine what approaches and policy measures are most appropriate for either compensation or redistribution. On the other hand, it is necessary to discuss how responsibilities to provide assistance should be differentiated. Before analysing the differentiation of responsibilities in the next section, here we discuss the first of these two issues. We argue that it makes a significant difference which kinds of climate L&D are at stake since different kinds of L&D demand different measures requiring varying forms of competence and

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<sup>6</sup>To be sure, one implication of the distributive justice framing is that it brings legitimate claims for assistance in case of climate L&D on a par with any other claims for assistance in case of undeserved harm or even more generally any undeserved socio-economic disadvantage. This can be considered a strength of this alternative framing, because it shows that climate L&D cannot be appropriately dealt with in isolation (Caney 2012; Wallimann-Helmer 2015). However, it also points to the weakness of this framing, namely that it expands concerns about L&D beyond what is currently dealt with under the umbrella of the UNFCCC.

**Table 2.3** Indicative list of measures for different categories of losses and damages. Note that listed measures are not exhaustive and that these measures could apply under both compensatory or distributive justice framings

	Replaceable L&D (economic and some non-economic L&D)	Non-replaceable L&D (non-economic L&D)
Sudden-onset extremes (insurable L&D)	<p>Measures (A)</p> <ul style="list-style-type: none"> <li>● Risk transfer               <ul style="list-style-type: none"> <li>- Insurance (e.g. with subsidised premiums)</li> <li>- Micro insurance</li> <li>- Insurance/Risk pools</li> <li>- Catastrophe bonds</li> </ul> </li> <li>● National and international disaster funds</li> <li>● Risk reduction               <ul style="list-style-type: none"> <li>- Early warning systems</li> <li>- Preventive building measures</li> <li>- Planned relocation</li> </ul> </li> <li>● Technology transfer</li> </ul>	<p>Measures (B)</p> <ul style="list-style-type: none"> <li>● Recognition of loss (accompanied by financial payments or not)</li> <li>● Active remembrance (e.g. through museum exhibitions, school curricula)</li> <li>● Counselling</li> <li>● Official apologies</li> </ul>
Slow-onset processes (non-insurable L&D)	<p>Measures (C)</p> <ul style="list-style-type: none"> <li>● Risk reduction               <ul style="list-style-type: none"> <li>- Preventive building measures</li> <li>- Physical risk reduction measures (sea walls)</li> <li>- Planned relocation</li> </ul> </li> <li>● Technology transfer</li> <li>● Risk transfer via catastrophe bonds</li> <li>● Redress</li> <li>● Rehabilitation</li> </ul>	<p>Measures (D)</p> <ul style="list-style-type: none"> <li>● Alternative livelihoods provision</li> <li>● Recognition of loss (accompanied by financial payments or not)</li> <li>● Active remembrance (e.g. through museum exhibitions, school curricula)</li> <li>● Counselling</li> <li>● Official apologies</li> </ul>

involvement of those responsible to contribute to the measures to be taken (for an overview of categories and measures see Table 2.3).<sup>7</sup>

L&D needs to be rectified in order to ensure justice. Within the distributive justice framework, this means redistribution aiming at a baseline distribution where no undeserved harm had ever occurred. In case of climate impacts, this means aiming at overcoming undeserved burdens on some regions, communities, and individuals due to climate variability and extremes. In contrast to compensatory claims for redistribution to even out undeserved harms it is only necessary that the harm in fact can be neutralised by human action. This makes the distributive framing more comprehensive. It not only captures L&D caused by anthropogenic climate change

<sup>7</sup>By thus arguing we implicitly assume the ability-to-pay principle as the appropriate principle for differentiating responsibilities. In the next section we explain more thoroughly how we think this principle must be understood in case of L&D.

but also climate impacts brought about by natural climate variability and extremes. However, a large amount of the responsibilities involved by these considerations does not concern natural climate variability but anthropogenic climate change. Most responsibilities captured in a distributive framework would also directly apply in a compensatory framework as well.

The categorisation of appropriate measures to respond to different kinds of L&D significantly depends on whether the distinction between adaptation and L&D is drawn using a “beyond adaptation” or a “risk tolerance” approach. While according to the “risk tolerance” approach, the appropriateness of measures does depend on how those potentially affected assess different kinds of risk for L&D, the “beyond adaptation” approach can do so without involving them. Focusing on the “beyond adaptation” approach for now, the relevant climate impacts concern L&D that *cannot* and also in some cases *will not* be avoided. L&D that cannot be avoided must be considered undeserved harm to the extent that those facing climate impacts did not contribute to their occurrence. L&D that will not be avoided is undeserved harm to the degree that it can be traced back to adaptation constraints that are not self-inflicted. In both cases, redistributive responses will have to differ depending on whether they are designed to deal with replaceable or non-replaceable values, values which can be non-economic/non-market-based or economic/market-based L&D.

In the case of economic/market-based L&D, measures will have to either manage/transfer financial risks or to provide adequate monetary/financial redress for L&D. However, in the non-economic case, novel approaches for ends-displacing have to be identified (Wallimann-Helmer 2015). Many such assets (encompassing material goods and non-material services) fall into the category of non-economic values, which have entered the L&D discourse as the concept of *non-economic loss and damage* or, after COP21 in Paris, *non-economic losses* (NELD; see also chapter by Serdeczny 2018). Commonly cited examples of NELD include loss of life, human health, cultural heritage, ecosystem services and indigenous knowledge (e.g. Fankhauser et al. 2014; Morrissey and Oliver-Smith 2013). NELD can occur as direct and indirect consequences of climate change, including negative side effects of adaptation (Serdeczny et al. 2016). They share the criterion that they are not commonly traded in the market.<sup>8</sup>

Non-economic L&D can be replaceable or non-replaceable. Non-replaceable, non-economic L&D or simply “losses” might be perceived as losses of irreplaceable ends by those affected. In other words, the assets lost in case of this kind of L&D might be perceived as ends in themselves. Following Goodin (1983), characteristics for regarding assets as irreplaceable are typically tied to (1) personal integrity, both bodily and mentally; (2) history; and (3) variety. Many assets typically listed as NELD correspond to these characteristics. Loss of cultural identity, sense of place or indigenous knowledge, for example, are inextricably tied to a community’s integrity (Bell 2004; Heyward 2014; Zellentin 2010, 2015). A fishing community having lost its traditional fishing grounds will never be the same again because it lacks a central

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<sup>8</sup>For this reason, “non-market losses” might be a more adequate description of such losses, but the term was not adopted in the policy process.

part of its own integrity. Loss of cultural heritage relates to historical characteristics, where no replica of the lost object will be regarded as equivalent to the original. Finally, biodiversity, another often quoted NELD distinct from ecosystem services, is valued as an asset of variety.

Offsetting losses of irreplaceable ends necessarily relies on providing alternative ends that are perceived by those affected as being able to provide a similar level of wellbeing compared to before the loss. The fishermen's community might receive funding enabling them to become farmers with comparable income levels, food security and social status as before. However, according to Goodin (1989), a shift in preferences will have been forced upon them, infringing upon their integrity and personal autonomy and ultimately leaving them in a state of undeserved harm. What follows is that actions that inflict the loss of irreplaceable assets on others can never be fully addressed by any amount of remedy. This is especially important considering financial payments. Whatever amount of money is paid to a harmed community, if the ends are irreplaceable, by definition such payments cannot make the community whole again. But financial payments and other actions recognising the fact of undeserved L&D are certainly important steps for regaining a just baseline distribution (cf. Thompson and Otto 2015; Huggel et al. 2016).

Non-economic but replaceable values can either fulfil different ends or constitute ends in themselves, with the distinction being culturally- or even individually-contingent. Ecosystem services, for example, are often valued as a means because they provide important resources for human health and nourishment. The value of cultural heritage in turn might be understood by some as a means to the end of community identity or social stability or by others as an end in itself. In case the losses are means towards some end, an appropriate response would ideally replace those lost means, i.e. to provide those affected with new means to achieve the same ends (cf. Goodin 1989). Following such an understanding, loss of ecosystem services (e.g. health and nourishment) could sensibly be responded to by providing medication to maintain human health and supporting agricultural production to maintain previous (if adequate) levels of nourishment. In other words, in order to even out undeserved harms due to climate change, non-economic values which fulfil ends require measures for their replacement by other non-economic values or by financial payments. In contrast to irreplaceable assets, if non-economic values are perceived as replaceable, the undeserved harm can be fully addressed and the just baseline can be maintained despite infliction of harm. This is more clearly the case when economic assets are at issue. In many cases, economic goods can be replaced by simply reimbursing their economic costs or by providing a substitute of the same (market) value.

It is far from clear, however, what mechanisms will lead to progress in making the most vulnerable more resilient to climate change. In line with policy proposals and current literature on mechanisms to tackle L&D (e.g. AOSIS 2008; Burkett 2014; Mace and Verheyen 2016; Mechler and Schinko 2016), we identify L&D measures comprising the following three components (see chapter by Schinko et al. 2018): (1) *Comprehensive risk management* to support and promote risk management tools to reduce the risk of future losses and damages in addition to mitigation and adaptation, (2) *risk financing* comprising *risk-transfer, sharing and pooling* to support

particularly vulnerable countries to manage their increasing financial risks due to increasingly frequent and severe extreme weather events, and (3) *curative measures* such as *redress and rehabilitation* mechanisms to tackle irreversible impacts due to progressive slow-onset processes (e.g. sea level rise, ocean acidification, increasing land and sea surface temperatures) and sudden-onset extreme events that cannot or will not be avoided.

Factoring in the distinction between economic and non-economic L&D, it seems clear that risk management and risk-financing mechanisms—the intuitively most plausible tools to deal with L&D—will not be sufficient in all cases (Surminski et al. 2016). This is why, in addition to comprehensive risk management, including risk-financing tools such as insurance, we may require curative action for redress and rehabilitation (Mechler and Schinko 2016). Such action may address a further important pillar of L&D measures, namely climate-related impacts that are deemed uninsurable. This is either because insurance is not the right instrument for tackling certain climate-related impacts, particularly those linked to slow-onset processes, such as loss of territory with attendant human displacement (Burkett 2014), or because commercial insurance is just not economically feasible.

Furthermore, it not only makes a difference whether risks of climate impacts are insurable or not. It also makes a difference whether L&D measures are designed to tackle sudden-onset extreme events or slow-onset processes. While risk financing instruments such as insurance are a theoretically feasible strategy to tackle extreme event risks, insurance is not applicable to deal with potential L&D caused by slow-onset processes. Indeed, insurance mechanisms also have been found to encounter limitations even in the case of sudden-onset risks (Mechler et al. 2014; chapters on insurance in this book by Schäfer et al. 2018 and Linnerooth-Bayer et al. 2018). Insurance may only be available for certain risks within a certain probability range or for what would be considered “acceptable” by those underwriting to the “risks based” distinction between adaptation and L&D and, hence, may not apply to L&D. Risk transfer and sharing schemes do not directly reduce the probability of occurrence or the severity of negative impacts from climate risks, although they can provide incentives to that end (Linnerooth-Bayer and Mechler 2009). Moreover, inappropriately constructed insurance schemes can have unwanted consequences and may neither benefit the poor nor foster climate resilience (Vivid Economics 2015).

What seems to be needed to appropriately address L&D is something like the “Multi-Window Mechanism to address loss and damage” suggested by AOSIS (AOSIS 2008) or what Roderick and Verheyen (2008) as well as Burkett (2014) call a “Compensation Protocol” and a “Small Island Compensation and Rehabilitation Commission to deal with impacts of slow-onset processes” (also cf. Boran and Heath 2016).<sup>9</sup> However, in our suggested framing the focus of such institutions would not only be on compensation and identifying the wrong-doers but rather on distributive justice. This would amount to redistributive mechanisms aiming at evening out

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<sup>9</sup>The mechanism suggested by AOSIS consists of three inter-dependent components: (1) an insurance component, (2) a rehabilitation/compensatory component, and (3) a risk management component, which taken together aim at enhancing overall adaptive capacities in SIDS.

undeserved L&D due to climate variability and extremes. What would be needed is a coordinated redistributive scheme, which could be operationalised under the UNFCCC as the body with the largest expertise and a clear focus on climate change and relevant approaches to cope with it.

Notably, such a scheme neutralising undeserved L&D incorporating and combining all of the components of L&D measures mentioned in this section will require substantial amounts of funding. Even though L&D is addressed in its own dedicated Article 8 of the Paris Agreement, no new funding stream for addressing L&D has been created. Nevertheless, as Mace and Verheyen (2016) point out, Article 8.3's reference to 'action and support', which should come through the WIM and the parties' action, demands financial mechanisms. With the exception of early voluntary commitments by developed countries to support the insurance component of L&D measures, it remains an open question what kind of existing funding schemes could be accessed or which additional funding windows should be established to address further components of L&D measures. Based on the two framings of compensatory and distributive justice, in the next section we set out to answer the question of who bears what responsibility for providing adequate levels of assistance in financial and non-financial terms to establish a comprehensive portfolio of L&D measures.

## 2.5 Differentiating Responsibilities for L&D Measures

Responsibilities will vary depending on whether we are adopting a compensatory or a distributive approach. Regarding the former approach, it is necessary to determine who or which groups have contributed to the harm. This is challenging from the point of view of attribution science as well as the applicability of national and international law (cf. chapter on attribution by James et al. 2018 and chapter on legal issues by Simlinger and Mayer 2018). Regarding the latter approach, redistribution to secure differentiated support for those facing L&D for undeserved harms is required. This is challenging from the point of view of being considerably more ambitious and counter to the agreements contained under the umbrella of the UNFCCC. However, since we are addressing the demands of justice here, it may be that justice requires radical restructuring. In this section we argue that in order to be effective and efficient a scheme to tackle L&D must take into account differences in capacity to provide specific support but also communal ties. Under a distributive framing, this leads to an extended ability to pay principle, incorporating considerations concerning how to most efficiently and effectively remedy undeserved harm due to L&D. According to this scheme, depending on the kinds of L&D at issue, different countries and regions have different duties in light of their abilities to pay. If adopting a compensatory approach, ability to pay might be a mitigating factor, but the compensation would primarily stem from the responsibility a group had for the occurrence of the harms in question.

To clarify the distinction between responsibility for the occurrence of undeserved harm and responsibility for remedy of harm we suggest to consider the distinction

between outcome responsibility and remedial responsibility: *outcome responsibility* denotes responsibility for bringing about a certain state of affairs and *remedial responsibility* denotes responsibility to even out harm (Hart and Honoré 2002; Honoré 2010; Miller 2007). Whilst the first kind of responsibility is backward-looking the second looks forward. In principle, both these conceptions of responsibility are independent. Irrespective of whether or not someone brought about a certain harm, she can be responsible to (help) remedy that harm. We believe that seeing somebody drowning puts us under duty to help, irrespective of whether we are responsible for that person drowning. By contrast, being outcome responsible for a certain harm does not always imply responsibility to (help) remedy this harm. Somebody who trips and falls thereby pushing another person in front of him might be responsible in terms of outcome but not necessarily in terms of remedy. If the one pushing could not avoid tripping and tripping is not due to a fault of her own then this is bad luck for both persons involved but no one is usually seen under duty for remedy.

In order to legitimately claim a connection between outcome responsibility and remedial responsibility, some kind of normatively relevant tie between the two must be established. Miller (2007) suggests moral failure, responsibility for the outcome and mere causal contribution as legitimate reasons for assigning remedial responsibilities based on outcome responsibility. If this kind of connection is or can be established, then we are in the realm of compensatory justice, because in this case it is the assignment of responsibility for a certain state of affairs that justifies remedial responsibility. Generally speaking, the most obvious way to differentiate responsibilities in case of harm like climate L&D would be to assign responsibilities for remedy in proportion to the contribution to the harm, like levels of greenhouse gas emissions. In case of L&D, the reasons linking outcome responsibility to remedial responsibility would amount to wrongful emitting, non-wrongful but significant contribution to the harm, or causal contribution. Whichever of these three reasons is operative in justifying a connection between outcome responsibility and remedial responsibility, it operates within the framing of compensatory justice. Those bringing about a harm are assigned responsibilities to make whole again those whom were impacted by their behaviour.

The potential reasons for linking outcome responsibility with remedial responsibility mentioned above are backward-looking, as is compensatory justice. When a harm has materialised, considerations of compensatory justice aim at identifying those responsible for the harm in order to assign remedial responsibilities. However, in light of our discussion such a (purely) backward-looking assignment of remedial responsibilities may not be fully appropriate for two reasons. First, in light of paragraph 52 of decision 1/CP.21 it may become politically unfeasible since it would amount to compensation and liability. This means that a “responsibility vacuum” might emerge when, for political reasons, duty-bearers do not step up to their remedial responsibilities. Furthermore, only a portion of experienced L&D would be covered were remedial responsibility to be based on outcome responsibility only. As shown before, natural climate variability as well as socio-economic factors on the ground contribute to much of the L&D as well.



Relying on Miller (2007) once again, there are at least three additional reasons allowing the differentiated assignment of remedial responsibilities without relying on backward looking considerations of outcome responsibility. That is, reasons applicable within a distributive justice framing. First, and in modification of the already mentioned BPP, those currently benefitting the most from emissions contributing to climate change are most often those also financially and technologically best able to foster L&D measures. Second, those with the best know-how to support one or several of the three components (comprehensive risk management, risk financing and curative measures) of a comprehensive scheme of L&D measures mentioned before can most efficiently and effectively provide assistance. Third, indigenous and other cultural knowledge shared by communities affected not only leads to special duties among them but also might help to provide more appropriate and effective support in practice. In the case of many communities and countries, the assignment of remedial responsibilities according to the first two reasons will most probably overlap because both determine the developed country parties to the UNFCCC to be under remedial duty. The third reason, by contrast, probably identifies developing country parties; e.g. members of AOSIS, to be under specified remedial duties.

Following on from Sect. 2.3 and independent of the reasons employed to assign remedial responsibilities, support must be differentiated at least along the following two lines: (a) whether L&D is replaceable or not, and (b) whether L&D measures shall tackle slow-onset processes or sudden-onset extreme events (see Table 2.3). The discussion in the previous section reveals that the first type of differentiation roughly corresponds but is not identical with the distinction between economic and non-economic L&D. The second type of differentiation largely correlates with whether L&D is insurable or not. These differentiations/categories need to be taken into account because a comprehensive scheme to appropriately tackle climate L&D must ultimately differentiate responsibilities in an efficient and effective way in order to be considered just. Notably, in terms of support for L&D, pledging finance is likely not enough and probably not the most efficient and effective form of support for communities and countries in need of assistance. What is further needed is assistance in capacity building and technology transfer in order for these communities to be able to take action allowing them efficiently and effectively to mediate the social and economic costs of climate L&D.

Transfer of technology without know-how available tends to be less effective. In order to be effective, we claim that a fair differentiation of responsibilities must not only befall those able to foster L&D measures but also those potentially harmed. As already mentioned, the effectiveness of measures is substantially increased if those profiting from them are also involved in their implementation and maintenance. Similarly, shared indigenous or cultural knowledge especially in countries and regions facing similar risks of L&D can become relevant as well. We believe that such ties as well as geographic proximity can significantly increase the efficiency and effectiveness of implementation and maintenance of measures (Wallimann-Helmer 2016). Furthermore, without transfer of know-how, pledging finance might contribute to unfairness when it comes to applying for financial support to implement L&D measures. For instance, there is far less detected and attributed climate events in countries

probably facing the most severe climate impacts (Huggel et al. 2016). This is not only the case because in these regions of the world measurement stations are lacking but also because there is missing capacity to establish and analyse the necessary data for effective risk management.

According to these considerations for assigning remedial responsibilities in relation to the four categories of L&D measures, we believe that replaceable L&D can most probably be moderated by appropriate schemes of risk management and detection in combination with mechanisms of risk financing like insurance (see Table 2.4). This is especially the case if that L&D is of an economic nature and occurs due to expected sudden-onset extreme events. Countries under the greatest duties in this case are those able to financially contribute to these schemes and/or possessing the know-how to assist in implementing them. However, responsibilities might befall other countries when slow-onset processes are at issue since these processes might contribute to non-replaceable and non-insurable L&D. Although in such cases financial payments might have great importance in the sense of providing recognition for undeserved harms, transfer of know-how between communities with similar cultural experiences and under similar threats of L&D seems to be central to efficiently and effectively helping even out the undeserved harms due to climate change. In case of non-replaceable L&D, ends-displacing becomes necessary, a competence most probably possessed by those communities already having gone through similar processes of transformation.

Deciding whether or not non-economic L&D can be deemed replaceable is an issue that is not easily determined without involving those facing these impacts (Wallimann-Helmer 2015). This is so, because by definition non-economic L&D is not traded in the market and cannot be weighed up with any established market price. This also makes it difficult to decide whether or not non-economic but replaceable L&D can be insured since for insurance assessment of the financial value in economic terms becomes key. And even if non-economic L&D can be deemed insurable, its value to be insured cannot objectively be decided without involving those whose assets are potentially damaged or lost due to sudden-onset extreme events or slow-onset processes. For these reasons, for differentiating remedial responsibilities we believe it to be crucial to also consider the differentiated competences to foster appropriate decision-structures and capacity building within potentially threatened communities. Indeed, this may apply either relying on outcome responsibilities or reasons independent of responsibilities for the occurrence of L&D.

Once appropriate decision-making structures and capacity are established within communities and countries potentially threatened by climate L&D and in need of assistance, they acquire remedial responsibilities to other threatened countries as well (Wallimann-Helmer 2016). Appropriate finance and technology provided, developing countries not only acquire responsibilities for implementing and maintaining L&D measures in their own regions. Since they also gain specific know-how on how to most efficiently and effectively respond to the specific L&D they face, they also become more responsible to assist those facing the same or similar L&D. Consequently, the more developed the decision-structures and capacities in communities initially in need of assistance become, the more they acquire responsibilities to assist

**Table 2.4** Categorisation of the differentiated remedial responsibilities of countries to foster L&D measures without exclusively relying on outcome responsibility

	Replaceable L&D (economic and some non-economic L&D)	Non-replaceable L&D (non-economic L&D)
Sudden-onset extremes (insurable L&D)	For measures (A) mainly countries are remedially responsible that are best able to: <ul style="list-style-type: none"> <li>• financially support risk transfer (e.g. insurance or catastrophe bonds) schemes</li> <li>• financially support risk reduction (e.g. preventive building measures) and relocation schemes</li> </ul> and/or <ul style="list-style-type: none"> <li>• provide technology and know-how in setting up and maintaining such schemes</li> </ul>	For measures (B) mainly countries are remedially responsible that are best able to: <ul style="list-style-type: none"> <li>• financially support securing recognition, remembrance of loss and counselling</li> </ul> and/or <ul style="list-style-type: none"> <li>• provide experience and know-how how to overcome loss</li> </ul>
Slow-onset processes (non-insurable L&D)	For measures (C) mainly countries are remedially responsible that are best able to: <ul style="list-style-type: none"> <li>• financially support risk reduction and relocation schemes</li> <li>• financially support catastrophe bonds schemes for countries at risk</li> </ul> and/or <ul style="list-style-type: none"> <li>• provide technology and know-how in setting up and maintaining such schemes</li> </ul>	For measures (D) mainly countries are remedially responsible that are best able to: <ul style="list-style-type: none"> <li>• financially support securing recognition, remembrance of loss and counselling</li> </ul> and/or <ul style="list-style-type: none"> <li>• provide experience and know-how how to achieve alternative livelihoods</li> </ul>

other communities and countries still in need of assistance. To increase efficiency and effectiveness, it seems plausible that those countries are also under a duty to assist those in need of assistance who are facing similar (risks of) L&D as they were or are threatened with themselves.

## 2.6 Conclusions

In this chapter we aimed at mapping out the most important ethical considerations relevant in case of climate L&D. Especially in light of the Paris Agreement and the multi-causality of factors beyond anthropogenic climate change contributing to L&D, we elaborated on the ethical implications of L&D—in the short to medium term—within a distributive framework. In addition to differentiating responsibilities in light of compensatory considerations and liability, we argued that L&D could also be

understood as undeserved harms demanding redistribution to even out unfairness. As we have shown, evening out such unfairness demands being able to specify the measures exclusively relevant for L&D either defined as being beyond adaptation and/or as intolerable levels of risks, where coping capacities of communities are breached. However, regardless of the appropriate framing, it becomes essential to foster appropriate decision-making structures and capacity building for those facing the risks of L&D. These capacities significantly contribute to the efficiency and effectiveness of L&D measures, measures which comprise a complex net of approaches including comprehensive risk management, risk finance schemes and curative mechanisms.

The advantage of the alternative framing of distributive justice is to help overcome political deadlock and potential conceptual confusion. Notably, we do not claim compensatory justice to be irrelevant for differentiating responsibilities for L&D. Much of our deliberations were motivated by paragraph 52 of decision 1/CP.21 which posits that Article 8 of the Paris Agreement does not provide any basis for compensation or liability. From this we read that implementing support for L&D based on compensatory justice may be currently politically unfeasible. However, political infeasibility is not to be mistaken with moral appropriateness. We have argued that the conditions for compensatory justice to apply, i.e. no excusable ignorance and exceeding fair shares of emissions, potentially limit the application of compensatory claims at the individual level. Here, the difficulty in attributing L&D to anthropogenic climate change poses a further practical challenge.

However, we also argued that these considerations must be qualified at the community level of whole countries: No country can be excused anymore for ignorance after publication of the IPCC reports, and the emissions of a large number of countries have been deemed to exceed fair shares on multiple accounts. According to these considerations, compensatory justice thus clearly becomes relevant and should drive action of countries under the UNFCCC from a moral point of view. Notably, it should drive increased mitigation ambition as it is clear that some of the losses due to climate change are irreplaceable and those affected cannot be made whole again. But as long as compensation for L&D creates political deadlock and in order to secure that those under threat get full and not only partial assistance, a framework based on distributive justice to even out undeserved harm should be considered relevant in implementing practical approaches to L&D and identifying responsibilities for doing so as well.

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## References

- AOSIS (2008) Submission of alliance of Small Island States. In: Ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan, Submissions from Parties, Addendum, Part I (UN Doc. FCCC/AWGLCA/2008/Misc.5/Add.2 (Part I), pp 9–32
- Bell DR (2004) Environmental refugees: what rights? which duties? *Res Publica* 10:135–152
- Boran I, Heath J (2016) Attributing weather extremes to climate change and the future of adaptation policy. *Ethics Policy Environ* 19(3):239–255
- Burkett M (2014) Loss and damage. *Clim Law* 4(1–2):119–130
- Calliari E, Surminski S, Mysiak J (2018) The politics of (and behind) the UNFCCC’s loss and damage mechanism. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) Loss and damage from climate change. Concepts, methods and policy options. Springer, Cham, pp 155–178
- Caney S (2012) Just emissions. *Philos Public Aff* 40(4):255–300
- Chambwera M, Mohammed K (2014) 7. Economic analysis of a community-based adaptation project in Sudan. In: Ensor J, Berger R, Huq S (eds) Community-based adaptation to climate change. Practical Action Publishing, Rugby: Warwickshire, United Kingdom, pp 111–128
- Cohen AI (2016) Corrective vs. distributive justice: the case of apologies. *Ethic Theor Moral Practice* 19(3):663–677
- Dow K, Berkhout F, Preston BL, Klein RJ (2013a) Limits to adaptation. *Nat Clim Change* 3(4):305–307
- Dow K, Berkhout F, Preston BL (2013b) Limits to adaptation to climate change: a risk approach. *Current Opin Environ Sustain* 5(3–4):384–391
- Fankhauser S, Dietz S, Gradwell P (2014) Non-economic losses in the context of the UNFCCC work programme on loss and damage (policy paper). London School of Economics – Centre for Climate Change Economics and Policy, Grantham Research Institute on Climate Change and the Environment
- Gardiner SM, Caney S, Jamieson D, Shue H (eds) (2010) *Climate ethics: essential readings*. Oxford University Press, Oxford, New York
- Goodin RD (1983) The ethics of destroying irreplaceable assets. *Int J Environ Stud* 21(1):55–66
- Goodin RE (1989) Theories of compensation. *Oxford J Legal Stud* 9(1):56–75
- Handmer J, Nalau J (2018) Understanding loss and damage in Pacific Small Island developing states. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) Loss and damage from climate change. Concepts, methods and policy options. Springer, Cham, pp 365–381
- Hart HLA, Honoré T (2002) Causation in the law (2nd edn) reprinted by Clarendon Press, Oxford
- Heslin A (2018) Climate migration and cultural preservation: the case of the marshallese diaspora. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) Loss and damage from climate change. Concepts, methods and policy options. Springer, Cham, pp 383–391
- Heyward C (2014) Climate change as cultural injustice. In: Brooks T (ed) *New waves in global justice*. New waves in global justice. Palgrave Macmillan: Basingstoke, Hampshire, UK, pp 149–169
- Honoré A (2010) Causation in the law. In: Zalta EN (ed) *Stanford encyclopedia of philosophy*. Stanford University (online), Stanford, pp 1–22
- Huggel C, Stone D, Auffhammer M, Hansen G (2013) Loss and damage attribution. *Nat Clim Change* 5:694–696
- Huggel C, Wallimann-Helmer I, Stone DA, Cramer W (2016) Reconciling justice and attribution research to advance climate policy. *Nat Clim Change* 6(10):901–908
- Jagers SC, Duus-Otterström G (2008) Dual climate change responsibility: on moral divergences between mitigation and adaptation. *Environ Politics* 17(4):576–591
- James R, Otto F, Parker H, Boyd E, Cornforth R, Mitchell D, Allen M (2014) Characterizing loss and damage from climate change. *Nat Clim Change* 4(11):938–939
- James RA, Jones RG, Boyd E, Young HR, Otto FEL, Huggel C, Fuglestedt JS (2018) Attribution: how is it relevant for loss and damage policy and practice? In: Mechler R, Bouwer L, Schinko T,

- Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 113–154
- Kaswan A (2016) Climate change adaptation and theories of justice. *Archiv für Rechts- und Sozialphilosophie* 149 (Beihefte):97–118
- Klein R, Midgley GF, Preston BL, Alam M, Berkhout F, Dow K, Shaw MR (2014) Adaptation opportunities, constraints, and limits. In: *Climate change 2014: impacts, adaptation, and vulnerability. Part A: global and sectoral aspects. Contribution of working group II to the fifth assessment report of the intergovernmental panel of climate change*. In: Field CB, Barros VR, Dokken DJ, Mach KJ, Mastrandrea MD, Bilir TE, Chatterjee M, Ebi KL, Estrada YO, Genova RC, Girma B, Kissel ES, Levy AN, MacCracken S, Mastrandrea PR, White LL (eds). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp 899–943
- Kolstad C, Urama K, Broome J, Bruvoll A, Fullerton D, Gollier C, Hahnemann WM, Hassan R, Jotzo F, Khan MR, Meyer L, Mundaca L, Olvera C (2015) Social, economic, and ethical concepts and methods. In: Ottmar E et al (eds) *Climate change 2014. mitigation of climate change. Working group III contribution to the fifth assessment report of the intergovernmental panel on climate change*. Cambridge University Press, New York, pp 207–282
- Lees E (2016) Responsibility and liability for climate loss and damage after Paris. *Clim Policy* 17(1):59–70
- Linnerooth-Bayer J, Mechler R (2009) *Insurance Against Losses from Natural Disasters in Developing Countries*. DESA Working Paper No. 85 ST/ESA/2009/DWP/85
- Linnerooth-Bayer J, Surminski S, Bouwer LM, Noy I, Mechler R (2018) Insurance as a response to loss and damage? In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 483–512
- Mace MJ, Verheyen R (2016) Loss, damage and responsibility after COP21: all options open for the Paris agreement. *RECIEL* 25(2):197–214
- Mayer B (2017) Climate change reparations and the law and practice of state responsibility. *AsianJIL* 7(01):185–216
- Mechler R, Schinko T (2016) Identifying the policy space for climate loss and damage. *Science* 354(6310):290–292
- Mechler R, Bouwer LM, Linnerooth-Bayer J, Hochrainer-Stigler S, Aerts JCJH, Surminski S, Williges K (2014) Managing unnatural disaster risk from climate extremes. *Nat Clim change* 4(4):235–237
- Mechler R et al (2018) Science for loss and damage. Findings and propositions. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 3–37
- Meyer LH (2003) Past and future: the case for an identity-independent notion of harm. In: Meyer LH, Paulson SL, Pogge T (eds) *Rights, culture, and the law: themes from the legal and political philosophy of Joseph Raz*. Oxford University Press, Oxford, pp 143–159
- Meyer LH (2004) Compensating wrongless historical emissions of greenhouse gases. *Ethical Perspect* 11(1):20–35
- Meyer LH (2013) Why historical emissions should count. *Chicago J Int Law* 13(2):598–614
- Meyer LH, Roser D (2010) Climate justice and historical emissions. *Critical Rev Int Soc Polit Philos* 13(1):229–253
- Meyer LH, Sanklecha P (2017) On the significance of historical emissions for climate ethics. In: Meyer L, Sanklecha P (ed) *Climate justice and historical emissions*. Cambridge University Press: Cambridge
- Miller D (2007) *National responsibility and global justice*. Oxford University Press, Oxford
- Morrissey J, Oliver-Smith A (2013) Perspectives on non-economic loss and damage. Understanding values at risk from climate change. In: Warner K, Kreft S (eds) *Perspectives on non-economic loss and damage*
- O'Neill J (2017) The price of an apology: justice, compensation and rectification. *Camb J Econ* 41:1043–1059

- Page EA, Heyward C (2016) Compensating for climate change loss and damage. *Polit Stud* 65(2):356–372
- Roderick P, Verheyen R (2008) Beyond adaptation—the legal duty to pay compensation for climate change damage. WWF-UK, Climate Change Programme discussion paper 2008
- Schäfer L, Warner K, Kreft S (2018) Exploring and managing adaptation frontiers with climate risk insurance. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 317–341
- Schinko T, Mechler R, Hochrainer-Stigler S (2018) The risk and policy space for loss and damage: integrating notions of distributive and compensatory justice with comprehensive climate risk management. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 83–110
- Serdeczny O (2018) Non-economic loss and damage and the Warsaw international mechanism. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 205–220
- Serdeczny O, Waters E, Chan S (2016) Non-economic loss and damage: addressing the forgotten side of climate change impacts. German Development Institute Briefing Paper 2016/3
- Shue H (1999) Global environment and international inequality. *Int Affairs* 75(3):531–545
- Shue H (2017) Responsible for what? Carbon producer CO<sub>2</sub> contributions and the energy transition. *Clim Change* 144(4):591–596
- Simlinger F, Mayer B (2018) Legal responses to climate change induced loss and damage. In: Mechler R, Bouwer L, Schinko T, Surminski S, Linnerooth-Bayer J (eds) *Loss and damage from climate change. Concepts, methods and policy options*. Springer, Cham, pp 179–203
- Surminski S, Bouwer LM, Linnerooth-Bayer J (2016) How insurance can support climate resilience. *Nat Clim Change* 6(4):333–334
- Thompson A, Otto FEL (2015) Ethical and normative implications of weather event attribution for policy discussions concerning loss and damage. *Clim Change* 133(3):439–451
- UNFCCC (2014) Report of the Conference of the Parties on its nineteenth session, held in Warsaw from 11 to 23 November 2013: Part two: Action taken by the Conference of the Parties at its nineteenth session
- UNFCCC (2015) COP 21 Adoption of the Paris agreement
- Vivid Economics (2015) Building an evidence base on the role of insurance-based mechanisms in promoting climate resilience. <http://www-cif.climateinvestmentfunds.org/events/ppcr-sub-committee-meeting-thursday-november-12-2015-130-pm-500-p>
- Wallimann-Helmer I (2015) Justice for climate loss and damage. *Clim Change* 133(3):469–480
- Wallimann-Helmer I (2016) Differentiating responsibilities for climate change adaptation. *Archiv für Rechts- und Sozialphilosophie* 149 (Beihefte):119–132
- Zellentin A (2010) Climate migration: cultural aspects of climate change. *Analyse & Kritik* 1:63–86
- Zellentin A (2015) Climate justice, small island developing states & cultural loss. *Clim Change* 133(3):491–498

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