

A typology of loss and damage perspectives

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1 **A typology of loss and damage perspectives**

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14

15 **Loss and Damage (L&D) has been the subject of contentious debate in**
16 **international climate policy for several decades. Recently, formal mechanisms**
17 **on L&D have been established, but arguably through unclear language. This**
18 **ambiguity is politically important, but researchers and practitioners require**
19 **clearer understandings of L&D. Here we report on the first in-depth empirical**
20 **study of actor perspectives, including interviews with 38 key stakeholders in**
21 **research, practice, and policy. We find points of agreement and also important**
22 **distinctions in terms of: the relationship between L&D and adaptation, the**
23 **emphasis on avoiding versus addressing L&D, the relevance of anthropogenic**
24 **climate change, and the role of justice. A typology of four perspectives is**
25 **identified, with different implications for research priorities and actions to**
26 **address L&D. This typology enables improved understanding of existing**
27 **perspectives and so has potential to facilitate more transparent discussion of**
28 **the options available to address L&D.**
29

30 The L&D issue has its origins in calls from Small Island Developing States (SIDS) for
31 compensation for climate change impacts, particularly sea level rise^{1,2}. It is often
32 characterised as a highly political, contentious and polarised debate between
33 developed and developing countries^{1,3}. In recent years, however, agreements have
34 been made between parties, and L&D has become a formal part of the United
35 Nations Framework Convention on Climate Change (UNFCCC), with the
36 establishment of the Warsaw International Mechanism (WIM), in 2013⁴, and the more
37 recent Paris Agreement⁵, which established a separate article on L&D, and ensured
38 the continuation of the WIM. Arguably, these political agreements have been made
39 possible through ambiguous language⁶, and it is not clear from UNFCCC decisions
40 exactly what L&D signifies. There is no formal definition of L&D, and there have been
41 no official discussions about what the term means⁷.

42
43 Now, attention is also being given to implementation. The WIM has an Executive
44 Committee (ExCom), with a mandate to explore implementation of approaches to
45 address L&D⁸; and the science-practice-policy community, including adaptation and
46 disaster risk practitioners, from non-governmental organisations, consultancies, UN
47 agencies, and development banks, are looking for ways to understand and address
48 L&D⁹⁻¹². There has also been a substantial growth in the number of academic papers
49 referring to L&D¹³⁻¹⁶ (see supplementary figure 1). All of these emerging actors
50 engaging in L&D discussions may have different perspectives on L&D; and certainly
51 several have highlighted the lack of clarity surrounding L&D^{13,17}. There have been
52 some efforts to develop working definitions^{9,18,19} and frameworks^{20,21}, however these
53 still leave room for different interpretations. For example, one UNFCCC literature
54 review defined L&D as “the actual and/or potential manifestation of impacts
55 associated with climate change in developing countries that negatively affect human
56 and natural systems”²². This leaves some important questions about L&D open⁷,

57 including how actions to address L&D might be distinct from existing adaptation,
58 disaster risk reduction (DRR), development and humanitarian work^{23, 24}.

59

60 Therefore, whilst there are good reasons for ambiguity in the political domain⁶,
61 moving from negotiations to implementation, greater clarity may prove to be
62 important. This does not imply that all emerging stakeholders must agree on one
63 definition of L&D, but that they may benefit from understanding the range of
64 viewpoints that already exist, and that inform current practice. By making implicit
65 definitions visible, more informed discussion around options to address L&D might be
66 facilitated.

67

68 Previous work has characterised party positions on L&D^{2, 3, 25}, and analysed L&D
69 framings and discourses in UNFCCC documents and discussions^{1, 6}. Here we draw
70 on social science and co-production approaches to deliver an empirical,
71 transdisciplinary study of L&D perspectives from a range of stakeholders across
72 science, practice and policy (UNFCCC negotiators and policy-makers, and
73 researchers and practitioners with expertise in adaptation, DRR, law, climate science,
74 philosophy, and economics). The analysis is based on interviews (conducted
75 between April and November 2015) with 38 stakeholders, systematically sampled to
76 represent diverse backgrounds, and promote gender and regional balance (see
77 Methods for details on sampling strategy).

78

79 Interviewees were asked about the meaning of L&D, and how it should be addressed.
80 The data were anonymised, and analysed to identify a “typology” of perspectives on
81 L&D that was iteratively refined through analysis of literature, including UNFCCC
82 decision texts, and sustained engagement with core communities working on L&D,
83 including feedback discussions with expert groups, notably at the third meeting of the

84 ExCom of the WIM (see Methods). We present the typology, and explore the
85 implications for practice, policy and research.

86

87 **Typology of perspectives**

88 We identify a spectrum of four L&D perspectives (Figure 1a). The perspectives do
89 not necessarily have associated definitions, but represent consistent viewpoints
90 about what L&D means and how to address it. We found that the term “loss and
91 damage” was not used consistently, sometimes being used to refer to impacts, and
92 sometimes to describe a mechanism or debate.

93

94 **Adaptation and mitigation perspective**

95 Some stakeholders highlight all anthropogenic climate change impacts as potential
96 L&D, and stress that the UNFCCC’s mandate is to avoid dangerous anthropogenic
97 interference, or L&D from climate change, for example stating “*the loss and damage*
98 *issue triggered the entire convention*” (interviewee 14, 2015). The UNFCCC already
99 has mechanisms for adaptation and mitigation, and this perspective implies that
100 these existing efforts are sufficient to prevent L&D. Stakeholders can express
101 confusion at the call for L&D mechanisms which are separate from adaptation, or
102 suggest that distinctions between adaptation and L&D are false or politically
103 motivated. As noted by one stakeholder: “*it’s hard to argue a differentiation between*
104 *loss and damage and adaptation or disaster risk management*” (interviewee 13,
105 2015).

106

107 **Risk management perspective**

108 For other stakeholders, new initiatives and discussions around L&D represent an
109 opportunity to work towards comprehensive risk management by building on existing
110 efforts under DRR, climate change adaptation, and humanitarian work. In the words
111 of one stakeholder: *“we need to take a holistic approach, linking these ongoing*
112 *initiatives together with sustainable development and DRR and climate change*
113 *resilience building” (interviewee 33, 2015). Managing L&D could include approaches*
114 *to risk reduction, risk retention, and risk transfer, including those which go beyond the*
115 *national level, and address high level risks (consistent with ref²⁶). The perspective*
116 *focuses on a techno-pragmatic problem approach. Separating L&D which can and*
117 *cannot be adapted to is perceived as unhelpful, for example: “if you start to have*
118 *policy processes at the national level, which treat L&D and adaptation as separate,*
119 *you lose the opportunity to manage it properly” (interviewee 35, 2015).*

120

121 **Limits to adaptation perspective**

122 This perspective on L&D is centred around the limits to adaptation, and residual L&D
123 beyond mitigation and adaptation. L&D generally applies to impacts of any climate-
124 related event, rather than just those that can be attributed to climate change^{9, 18}. The
125 focus is on vulnerability, and on the most vulnerable who are already perceived to be
126 suffering L&D. As one stakeholder explained: *“let’s say there’s a [crop] failure and we*
127 *don’t have enough to eat...Households are not passive, they react... cutting the*
128 *corners on calories, typically mothers will eat less. Over the long term, 900 calories a*
129 *day is not sustainable for the human body... Those little gaps at some point start*
130 *looking like L&D” (interviewee 18, 2015). This perspective draws on existing literature*
131 *on Limits to Adaptation, which, although contentious, has become mainstream within*

132 adaptation discussions²⁷, including in the Intergovernmental Panel on Climate
133 Change (IPCC) Working Group II report²⁸.

134

135 **Existential perspective**

136 For some, L&D represents a means to highlight the importance of addressing the
137 inevitable harm which climate change will impose on vulnerable countries,
138 populations, cultures, and ecosystems: *“harm is occurring, something needs to be
139 done about it” (interviewee 30, 2015)*. This perspective is “existential” in the sense
140 that climate change represents unavoidable transformation for some communities
141 and systems. There is an emphasis on irreversible loss, non-economic losses
142 (NELs), justice and responsibility. There is a sense of urgency to provide options for
143 those who are most vulnerable, for example through migration facilities; and there is
144 also discussion of compensation, whether monetary or non-monetary: *“It has ... an
145 element of compensation whether it's financial or other” (interviewee 30, 2015)*.

146
147

148 **Points of agreement and distinction**

149 Stakeholders agreed that L&D mechanisms should refer to both slow onset events
150 and extreme events²², consistent with UNFCCC policy documents^{4, 5, 29} and scientific
151 literature^{13, 17}. There was also some commonality across the interviews in terms of
152 whether L&D mechanisms should be “ex-ante” or “ex-post”. When asked whether
153 L&D mechanisms should aim to prevent “potential L&D” or address “actual L&D”,
154 most stakeholders agreed that both were important, however there was a difference
155 in terms of emphasis.

156

157 Within each perspective, distinct words and phrases (see Table 1) were found to be
158 frequently used or emphasised by interviewees when describing L&D (see Methods).
159 There is some inevitable overlap in terminology, but there is sufficient distinction in
160 key words to provide an important illustration of the divergence of understandings of
161 L&D. For example, some stakeholders speak more about “preventing” “potential
162 L&D”, or ex-ante measures, and some highlight the need for approaches to address
163 actual, “unavoidable”, L&D, or “ex-post” measures.

164

165 In Figure 1b, the ex-ante to ex-post axis (blue arrow) is displayed alongside an axis
166 illustrating the distance from adaptation and existing mechanisms (black arrow).
167 Current UNFCCC architecture is arguably focused on ex-ante measures, and the
168 Adaptation and Mitigation perspective would imply that these are sufficient to address
169 L&D; whereas the Existential perspective highlights the need for additional, ex-post
170 actions. This contrast can be observed between a quote from one stakeholder when
171 referring to the WIM: *“A huge part of what we are supposed to be doing is figuring out
172 how to reverse and revert L&D” (interviewee 31, 2015)*, and another: *“L&D policy
173 responses are not about preventing these impacts, they are not about trying to make
174 the risk of negative impacts small” (interviewee 19, 2015)*. The other perspectives lie
175 somewhere between, with Risk Management, for example, placing value on
176 comprehensive approaches which consider ex-ante and ex-post action together.

177

178 There are also differences in the spatial scale at which losses and damages are
179 described, represented by the purple arrow. Risk Management largely focuses on
180 global or national level analysis of risk, whereas Limits to Adaptation highlights
181 impacts at the local or community scale. The blue shading indicates differences in
182 the relevance of climate change. For the Adaptation and Mitigation and Existential
183 perspectives, L&D is about anthropogenic climate change, whereas Limits to

184 Adaptation and Risk Management highlight the importance of dealing with all climate-
185 related risks, for example: *“the more urgent issue is... actually... responding to or*
186 *adapting to extreme weather events, whether it’s caused by people or not”*
187 *(interviewee 34, 2015).*

188

189 The grey dashed contours refer to the emphasis on justice. For the Existential
190 perspective, questions of justice and responsibility are emphasised, and for some
191 central. For example one stakeholder describes the goal of the L&D mechanisms as
192 *“to get some sort of equity between different nations and generations” (interviewee*
193 *29, 2015), and another said “it’s about recognition that we have responsibility”*
194 *(interviewee 30, 2015). They view L&D as a way “to address the uneven power*
195 *balance that currently exists under the current negotiations” (interviewee 30, 2015).*

196 Several are quite specific that it is a “polluter pays” issue. This does not imply that the
197 other perspectives are not based on principles of justice: there is some explicit
198 mention of distributive justice in connection with risk management approaches²⁰ and
199 different ethical framings for L&D have been discussed^{30, 31}. However, during the
200 interviews there was generally little discussion of justice in connection with the other
201 perspectives.

202

203

204 **Action, research and finance for loss and damage**

205 Stakeholders were asked what kind of practical actions and scientific research would
206 be needed to address L&D. We analysed the logical implications of each perspective
207 for action, science, and financing; making inferences about appropriate tools for each
208 perspective (Table 2).

209

210 **Action**

211 The Adaptation and Mitigation perspective suggests that L&D should be dealt with
212 through existing mechanisms, and therefore does not imply distinct actions to
213 address L&D. The Risk Management perspective emphasizes a whole suite of risk
214 management tools. The Limits to Adaptation perspective typically highlights
215 participation, and favours actions associated with development interventions such as
216 informal social protection mechanisms, micro insurance, innovations in livelihood,
217 and early warning systems. The Existential perspective places more emphasis on ex-
218 post measures, including, more controversially, compensation and in some cases
219 litigation, but also other measures including resettlement.

220

221 There are some tools which are referred to by many stakeholders with different views
222 about L&D, for example insurance. However, there may be distinctions in what is
223 meant by this; as one stakeholder highlights: *“when I say insurance, there’s going to*
224 *be a payout around 6-9 months in the season after you pay your premium... when*
225 *other people talk about insurance, [they are asking] “where am I going to move my*
226 *25000 island population to resettle” (interviewee 34, 2015). Mace and Verheyen*
227 (2016) suggest that in the UNFCCC context “insurance” has been used by AOSIS for
228 decades, “somewhat euphemistically”, to refer to mechanisms that might provide
229 compensation, whereas developed countries prefer to highlight more traditional forms
230 of insurance. Further work is needed to establish what kinds of insurance are
231 relevant, how they combine with other actions to address L&D, and to identify cases
232 where insurance is not a suitable solution³².

233

234

235

236 For practitioners, the ambiguity surrounding L&D may be challenging for
237 implementation, as highlighted by one stakeholder: *“We can talk about L&D in*
238 *conceptual or theoretical level, but when it boils down to operations, it is quite*
239 *challenging with no definition”* (interviewee 33, 2015). Without agreement on how to
240 define L&D, it might prove difficult to measure the effectiveness of projects,
241 programmes and activities on the ground.

242

243 **Research**

244 When asked about science relevant to support L&D mechanisms, almost every
245 interviewee had a different answer, highlighting both the large number of research
246 gaps in this field and the diversity of views. Many stakeholders mentioned
247 attribution science at least partly due to their awareness of our own previous work on
248 extreme event attribution^{7, 33, 34}. There was variation between interviewees in terms of
249 their understanding of this science: some referred to specific forms of attribution
250 science or even specific academic papers, whereas others were broadly referring to
251 the concept of attributing causality. There was also variation in opinion about whether
252 attribution is useful for L&D, consistent with previous findings¹⁴. The most common
253 comment was to express caution about uncertainties in attributing specific losses to
254 anthropogenic climate change and/or the controversy of such findings, and an
255 emphasis that this should not delay action to support vulnerable people, for example:
256 *“We should worry about how to deal with this, let’s not worry about whether it’s*
257 *caused by humans”* (interviewee 28, 2015). This kind of emphasis was quite
258 consistent across the perspectives.

259

260 The Adaptation and Mitigation perspective does not imply new research questions to
261 understand L&D, additional to those which inform adaptation and mitigation. The Risk

262 Management perspective highlights understanding how climate change influences
263 existing risk, as one stakeholder explained: *“L&D is what happens as a result of the*
264 *combination of existing vulnerability plus changing risk profile that climate change*
265 *brings”* (interviewee 35, 2015). Analysis is needed to evaluate whether existing
266 disaster risk assessments can address this evolving risk from climate change, and to
267 identify gaps in risk management approaches. The Limits to Adaptation perspective
268 highlights the importance of gathering empirical evidence from vulnerable people to
269 understand their experiences of barriers to implementing adaptation and limits to its
270 effectiveness. The emphasis on adaptation limits implies that adaptation monitoring
271 and evaluation (M&E) is also important. The Existential perspective places specific
272 emphasis on permanent losses, which have received limited research attention to
273 date. Relevant aspects may include new questions about NELs such as loss of
274 homeland, livelihood, sovereignty, youthfulness, mental health and wellbeing,
275 including *“how loss is perceived and understood”* (interviewee 30, 2015) (as also
276 highlighted in recent academic papers^{35, 36}).

277

278 Science questions are not necessarily inconsistent across perspectives. For example,
279 even if stakeholders argue that L&D should be dealt with through adaptation and
280 mitigation, they would likely still see the benefit of M&E, which could identify areas
281 where adaptation measures can be improved. Therefore, scientific progress is not
282 inhibited by contrasting perspectives on L&D. However, there are many potential
283 research questions surrounding L&D (only partly covered by Table 2) and it is
284 unlikely that all can be answered. If science is to support policy, research-policy
285 dialogue on L&D is a necessary step to prioritise research needs.

286

287 **Finance**

288 The interviewees were deliberately not asked about finance related to L&D to judge
289 the extent to which this featured in their perception of the issue. Several interviewees
290 highlighted that there are others for whom financial support is key, for example:
291 *“there are countries... who... see... that loss and damage is about attribution of*
292 *blame and taking compensation...” (interviewee 13, 2015), and “in the end it’s about*
293 *who pays for what” (interviewee 25, 2015). This impression seems to be a key driver*
294 *of L&D discussions, with fear of paying compensation perhaps the reason that many*
295 *associated terms are off-limits. One interviewee explained how a developed country*
296 *government was “not prepared to talk about climate change that causes permanent*
297 *losses” (interviewee 17, 2015).*

298

299 Interestingly, none of the interviewees described their own position on L&D in this
300 way. There were some who made the case for monetary compensation, associated
301 with the Existential perspective, but these stakeholders also highlighted that this was
302 not the only, or even the most important issue, for example: *“The ultimate goal for*
303 *countries like St Lucia, can’t be simply to get money for lost lives, that would be*
304 *terrible to say there’s nothing we can do so let’s just collect a premium for the*
305 *thousand people who just died” (interviewee 30, 2015). This is consistent with*
306 *statements made by developing country negotiators³⁷.*

307

308 Other interviewees did not say much about finance, perhaps due to the controversial
309 nature of this issue. In connection with Risk Management, there was some emphasis
310 on private sector funding, but otherwise little discussion about who would pay for the
311 actions to address L&D. Financial instruments for L&D do feature in the WIM
312 ExCom’s initial two-year workplan, and were also the subject of a recent forum of the
313 Standing Committee on Finance³⁸. However, this matter is largely unresolved, as

314 illustrated in the indicative framework for the five-year rolling workplan of the ExCom,
315 which currently has a “placeholder for finance-related topics”⁸.

316

317

318 **Implications for policy**

319 For researchers and practitioners, characterising a spectrum of different perspectives
320 on L&D has potential to help identify the real options available for addressing L&D.

321 For UNFCCC policy-makers, however, there is an imperative for agreement and
322 convergence, and clarifying different perspectives could reopen discussions and stall
323 negotiations. So what does the typology of perspectives mean for progress in
324 international policy? What kind of stakeholders is each perspective associated with
325 and how do they relate to political positions and groupings? How far are the different
326 perspectives already represented in UNFCCC agreements?

327

328 Stakeholder groups were identified and mapped onto the typology in Figure 1c (see
329 Methods). One important finding is that there is not a simple polarization between
330 political actors from developed and developing countries, and stakeholders do not
331 neatly divide between the four perspectives. Many individuals express views which
332 encompass more than one perspective, and there are a few whose ideas about L&D
333 did not resonate with any of them (largely those who focused on the lack of clarity
334 around L&D, or who were highly skeptical of UNFCCC processes). In general, the
335 Adaptation and Mitigation perspective was associated with developed country
336 negotiators, and this is keeping with the proposals of Annex I countries during the
337 negotiations, specifically to have no separate article on L&D in the Paris Agreement.
338 This is in contrast to the SIDS and Least Developed Country (LDC) positions²⁵. We
339 interviewed several stakeholders who represent or advise these groups and their

340 views encompassed elements of the Existential, Limits to Adaptation and Risk
341 Management perspectives. The clearest expressions of the Existential, Limits to
342 Adaptation, and Risk Management perspectives were from climate justice
343 campaigners, adaptation practitioners, and disaster risk reduction experts,
344 respectively.

345

346 The WIM and Paris Agreement texts were also analysed, and mapped onto the
347 typology in Figure 1c. The WIM text⁴ is ambiguous and all encompassing. For
348 example, the WIM is part of the Cancun Adaptation Framework and thus could be
349 regarded as consistent with the Adaptation and Mitigation perspective. However, the
350 WIM is also sufficiently vague that it does not rule out specific measures, and the
351 workplan includes terminology which is associated with each of the perspectives
352 (Table 1), for example “comprehensive risk management”, “non-economic losses”,
353 and “particularly vulnerable”³⁹.

354

355 In the Paris Agreement and decision text⁵, the notion of L&D is a little more tightly
356 constrained. For the first time L&D is separated from adaptation in a separate article
357 (Article 8), which conflicts with some core aspects of the Adaptation and Mitigation
358 perspective. Conversely, the Paris decision text explicitly states (in paragraph 51)
359 that Article 8 does not involve liability and compensation, which implies that some
360 aspects of the Existential perspective are excluded. However, permanent and
361 irreversible losses are mentioned, which form a key component of the Existential
362 perspective. Vanhala and Hastbaek⁶ also find increasing precision in the Paris text
363 relative to the WIM.

364

365 The WIM and Paris Agreement represent success in reaching consensus, and in
366 incorporating language which spans much of the typology of perspectives. So does

367 this signal political convergence in terms of how to manage L&D? Mace and
368 Verheyen² argue that, from a legal perspective, the Paris text leaves “all options
369 open” for L&D. They highlight that the structure, mandate, and effectiveness of the
370 WIM is currently quite limited: it is not a legal entity and does not have technical
371 advisory or financial functions. Therefore even if key words from each perspective
372 are referred to in the texts of the WIM and the Paris Agreement this does not
373 guarantee that sufficient actions will be implemented to address L&D as conceived
374 under each perspective. Important questions remain about what actions will be
375 prioritised and who will be responsible for their implementation and financing.
376
377 Therefore, despite the imperative for convergence, characterizing the range of
378 perspectives might still be useful for policy-making. The typology reveals a complex
379 but rich array of knowledge, expertise and aspirations for L&D, and could be useful in
380 three key ways. First, while it may not be desirable to openly acknowledge points of
381 disagreement within political negotiations, it is important that policy-makers are
382 aware of different perspectives. If different perspectives are not reflected in the
383 actions which are implemented to address L&D, negotiations could re-emerge. The
384 typology might therefore be useful background information for policy-makers,
385 particularly those who are new to the L&D discussions. Second, the typology
386 demonstrates some points of agreement and overlaps between stakeholder groups
387 (see Figure 1c). Whilst there are disagreements, we do not find evidence for a simple
388 polarization between those who seek compensation and those who wish to avoid
389 paying compensation. This finding implies potential for some aspects of the debate to
390 be nuanced and depoliticised. The typology could be used to develop frameworks for
391 conceptualising L&D, which incorporate priorities from multiple stakeholders and
392 identify a policy space for L&D which is acceptable for different parties (and there
393 have been recent efforts to develop such a framework).²⁰

394

395 Finally, the typology could facilitate more transparent and informed discussion
396 outside, or on the fringes of, the policy sphere, about the span of options available for
397 research and actions to address L&D. These discussions might lead to research
398 findings and practical solutions which can later inform or be supported by UNFCCC
399 policy. For example, the typology could be used to identify research questions
400 associated with each perspective (informed by Table 2) as a basis for dialogue
401 between the ExCom and the IPCC on areas of science relevant to L&D for
402 assessment in its upcoming reports.

403

404 Many of the questions over the meaning of L&D are reminiscent of the long-standing
405 debate among adaptation scholars and practitioners of the need for clarity in what
406 adaptation means to effectively measure and implement adaptation⁴⁰. The challenge
407 of reaching specificity in a contested policy space is not a new one, but, in identifying
408 a typology of perspectives of L&D, we hope to fast track progress at an early stage of
409 L&D policy development.

410

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525

526 **Author contributions**

527 E.B., R.A.J and R.G.J. designed the research project, conducted interviews,
528 analysed interview data, and wrote and revised the text. H.R.P. conducted interviews,

529 contributed to data handling and developed of codes for analysis, and contributed to
530 the draft text. F.E.L.O. contributed by providing feedback on analysis, and
531 contributed to the draft text.

532

533 **Competing financial interests**

534 The authors declare no competing financial interests.

535

536 **Figure Legends**

537 **Figure 1 The typology of four perspectives on loss and damage**, (a) arranged
538 along an axis in terms of their characterisation of L&D, and how far suggested
539 approaches to address L&D are distinct from, or go beyond, existing adaptation
540 mechanisms (b) illustrating points of distinction between perspectives, and (c)
541 illustrating the extent to which each perspective in the typology is articulated by
542 stakeholder groups, and the extent to which UNFCCC mechanisms or agreements
543 encompass the perspectives.

544

545 **Tables**

546 **Table 1** Illustrative words and phrases associated with each perspective, extracted
547 from interview transcripts (see methods for further detail).

548

Perspective	Keywords
Adaptation and Mitigation	prevent, avoid, proactive, reducing and reversing L&D, reducing and minimising, averting and reducing, minimising risks, potential L&D, potential impact, L&D is under adaptation, humanitarian response, unfortunate
Risk Management	climate risk management, comprehensive climate management, holistic, total risk, risk layering, high level losses, changing risk profile, evolving risk, socioeconomic thresholds, extreme events,

	downside risks, risk financing, financial instruments, private sector, private sector engagement, risk management tools, objective data driven solutions, operational solutions, early intervention, risk reduction, early warning systems, risk pooling, regional risk pool, contingency planning, post-disaster recovery, resilience
Limits to Adaptation	limits to adaptation, adaptation limits, adaptation constraints, physical limits, social limits, beyond adaptation, residual loss & damage, residual impacts, migration, saline intrusion, agriculture, non-economic losses, climate-related stressors, community-based, values, livelihoods, resilience, vulnerable, poor and marginalised, developing countries, micro insurance
Existential	residual harm, permanent, irreversible, irreplaceable, gone forever, reality, it's happening, undeniable, unavoidable, nonmarket L&D, non-economic losses, values, sea level rise, islands, displacement, refugees, loss of homeland, resettlement, reconstruction, rehabilitation, restoration, compensation, ex-post, responsibility, anthropogenic climate change, justice, liability, equity, human rights, increase mitigation, more serious about mitigation

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Table 2 Actions, research, and financing appropriate under each perspective, based on suggestions by interviewees and inference from their characterisation of L&D

Perspective	Implications for practice: How to address L&D through action?	Implications for research: How to improve understanding of L&D?	Implications for finance: How to resource L&D?
Adaptation and Mitigation	Mitigation and adaptation.	All climate change impacts are potential L&D, therefore continuing research efforts to understand climate change impacts (e.g. climate change risk assessments for adaptation, climate services) are most relevant.	L&D does not require additional funding beyond existing climate finance.
Risk Management	Comprehensive risk management. Suggestions from interviewees include: insurance, insurance pools, catastrophe bonds, life insurance, DRR, sovereign disaster risk rating, climate services and early warning, engineering, capacity building.	Integration of disaster risk assessment with climate change risk assessment. Analysis of risk management tools to identify gaps.	Emphasis on insurance schemes and private sector finance.
Limits to Adaptation	Focus on options or contingency plans for vulnerable people. Emphasis from interviewees on: risk transfer, social safety nets, micro insurance, innovations in livelihoods (early warning), and participation.	Analysis of what is beyond adaptation. Research with vulnerable people to identify limits, monitoring and evaluation (M&E) for adaptation, climate change risk assessment with estimate of adaptation pathways and limits.	Emphasis is not generally on finance.
Existential	Focus on mitigation to avoid L&D, and ex-post measures to address loss, including: compensation, migration facilities, homeland resettlement, acknowledgement, official apologies, memorial, historical	Analysis of probability of, and vulnerability to, permanent, irreversible, long term, unavoidable changes. Assessment of L&D, which has already occurred. Research with vulnerable people to understand and anticipate loss,	Associated with calls for compensation, but emphasis that this is not the only or even most important aspect of addressing L&D.

	preservation, international litigation.	particularly non- economic loss (e.g. post traumatic stresses induced by events, loss of identity or sense of place).	
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556 **Methods**

557 *Summary*

558 This is an empirical and impact-focused science-policy study of stakeholder
559 perspectives on L&D, produced by a transdisciplinary team of researchers with
560 physical and social science expertise; emerging from a collaboration on a NERC
561 funded project about the attribution of extreme weather events in Africa (ACE-Africa).
562 The empirical results are based on 36 stakeholder interviews with 38 key
563 stakeholders, carried out in April-November 2015 by the co-authors. The primary
564 interview data have been triangulated with academic and grey literature, policy
565 documents, and participatory observations of meetings; and the results have been
566 refined through workshop engagement and feedback from key stakeholder groups,
567 and research project meetings. This research process involved sustained
568 engagement with core communities working on L&D, also generating wider impact
569 through dialogue, building networks, and documenting the process to co-produce
570 new insights on this critical and controversial topic between 2015 and 2017. The
571 study has been designed to be politically impartial, but it is important to highlight this
572 kind of analysis cannot be completely objective or replicable, as is common in social
573 sciences⁴¹.

574

575

576 *Sampling strategy*

577 Potential interviewees were identified through stakeholder mapping to identify
578 influential and important actors in relation to L&D. The core research team
579 constructed a list of researchers, practitioners, and policy-makers who were known to
580 meet at least one of the following criteria: they were involved in L&D negotiations or
581 other L&D activities under the UNFCCC including members of the ExCom; they had
582 attended UNFCCC L&D meetings as observers; they had written papers of other
583 documents about L&D; they were part of a L&D network, including the L&D network⁴²,
584 or Asia Pacific Forum on Loss and Damage⁴³; they were senior experts in adaptation,
585 disaster risk management, or UNFCCC processes. An effort was made to ensure
586 that this included experts from different types of institution (academic, non-
587 governmental organisations, international organisations, development banks,
588 consultancies, national government departments). Each interviewee was also asked
589 to recommend other interviewees following a snowball sampling technique⁴⁴. This
590 technique allowed the study to limit bias by capturing the range of actors involved in
591 the issues but with different views⁴⁵. This resulted in a list of over 100 potential
592 interviewees. Stakeholders from this list were prioritised using a carefully designed
593 set of criteria to encourage a balance of gender, expertise, and geographical area;
594 although the final sample of interviewees was also partly determined by availability
595 and willingness to interview. This resulted in a relatively large number of interviewees
596 from Europe, due in part to the location of the research team, and a relatively small
597 number of negotiators, possibly due to busy schedules and/or hesitancy to be
598 interviewed about this contentious topic.

599

600 The 38 interviewees included 23 men (60.5%) and 15 women (39.5%): and, based
601 on their current region, 63% from Europe, 13% from North America, 11% from
602 Oceania, 8% from Africa, and 5% from Asia (although it is worth highlighting that
603 many of the relevant stakeholders travel frequently and may have affiliations or

604 residences in more than one location). To give an insight into the type of
605 stakeholders interviewed, they were classified as primarily researchers (50%),
606 practitioners (29%), or negotiators (21%), although many of those interviewed have
607 hybrid careers, with many researchers also being practitioners in adaptation,
608 development or DRR, and many negotiators also working as civil servants or
609 practitioners when they are not at UNFCCC meetings. Many of those classified as
610 researchers were interviewed in part due to their work supporting negotiators. A
611 subjective assessment of expertise of interviewees suggests that 71% had prior
612 expertise in L&D, 55% in adaptation, and 62% in UNFCCC processes (many
613 obviously had expertise in all three of these key areas). Two of the interviewees
614 selected brought a colleague to the interview to help answer questions (bringing the
615 total to 38 interviewees and 36 interviews).

616

617 *Interview procedure*

618 The interviews were semi-structured, using a protocol interview guide (see
619 supplementary information), which included an opportunity for the interviewee to ask
620 questions and provide informed consent, and an assurance of confidentiality,
621 following ethical guidelines and approval from the University of Oxford Central
622 University Research Ethics Committee. Interviewees were asked about how they
623 would define L&D, whether they had come across other perspectives on L&D, the
624 distinction between adaptation and L&D mechanisms, what actions should be taken
625 to address L&D, scientific research which might be needed to support L&D
626 mechanisms, and the importance of defining L&D. Interviewees with prior experience
627 of UNFCCC negotiations were also asked about the emergence of L&D within the
628 negotiations. The questions were tested and refined through two pilot interviews.
629 Interviews were conducted by one or two members of our team, in person, on skype,
630 or via telephone, and lasted between 15 and 90 minutes, depending on the

631 availability of the interviewee, and the length of their answers. Where consent was
632 granted, interviewees were recorded, and transcribed by one of two research
633 assistants. Two of the interviews were not recorded, and instead the interviewer
634 wrote notes based on the interviewees responses. Following each interview, the
635 interviewer wrote some brief notes to comment on the tone of the interview and
636 inform consideration of reflexivity.

637

638

639 *Data analysis and development of the typology*

640 The interview transcripts were analysed using NVIVO, a qualitative data analysis
641 software. Coding was used to identify quotes under nine key themes, including the
642 distinction between adaptation and L&D mechanisms, the relevance of climate
643 change, ex-ante and ex-post actions, finance, and justice (see supplementary
644 information). These themes were identified from the literature, and from observations
645 at L&D discussions, as potential points of agreement and distinction in what signifies
646 L&D. Some of the themes link directly to questions which were asked to participants
647 (for example they were asked several questions about the distinction between L&D
648 and adaptation), and some of the themes were specifically not asked about in order
649 to gauge whether the interviewees would bring these issues up in discussion, and
650 therefore the amount of emphasis these themes had in their conceptualization of
651 L&D (including finance and justice). The coding was conducted by reading the key
652 interview questions which were associated with the theme, and/or searching for key
653 words associated with that theme. Following the coding, the quotes identified under
654 each code and theme were used to determine the extent to which this theme
655 represented a point of distinction or agreement across the stakeholders.

656

657 Then, in order to begin developing a typology of perspectives, each interview
658 transcript was considered in turn and the perspective of this interviewee was
659 summarised in line with the nine themes. After developing this summary for each
660 interviewee, it was possible to identify commonalities between some interviewees,
661 and to start to develop groupings of interviewees with similar perspectives. This was
662 not a simple process, and not all of the interviewees fit into these clusters. Some
663 interviewees had perspectives which seemed to span across multiple groups. Some
664 did not fit into any of the groupings, particularly those who didn't want to offer a
665 definition of L&D, because they were highly skeptical of UNFCCC processes,
666 because they didn't feel they understood L&D well enough to define it, or because
667 were aware of a lack of common understanding, many different perspectives, or
668 conflicting views, and therefore did not want to adopt any one definition themselves.
669 Nevertheless there were some interviewees with quite consistent perspectives that
670 were shared by a number of other stakeholders, making it possible to identify four
671 emerging clusters.

672

673 The grouping and clustering was conducted through iterative analysis, critical
674 reflection, and discussion amongst the core research team in a series of half-day
675 workshops. The coding themes were divided between two members of the team to
676 do analysis using NVIVO, and then results shared and discussed. Then the
677 summaries for each interview were written by one member of the team, these were
678 then discussed and refined through discussion. The groupings then emerged from
679 further discussion, which led to the drafting of a typology of four perspectives. There
680 were some remaining questions about these perspectives, which were then used to
681 check the coded quotes again and characterize how each perspective dealt with
682 each point of distinction and agreement (ultimately leading to Figure 1b). Following
683 this iterative analysis a typology of four perspectives had been developed, and each

684 interviewee was categorised as either representing one perspective well, or spanning
685 multiple perspectives, or not fitting into any of the perspectives (but also not really
686 expressing clear or strong opinions about what L&D signifies).

687

688 The typology was then reviewed based on an analysis of L&D literature, including
689 UNFCCC texts, as well as reflections and observations from participation in
690 approximately 20 conferences, workshops, and meetings which included a focus on
691 L&D.

692

693 In the social sciences typologies are a well-established analytical tool⁴⁶. They are
694 used to form and refine concepts, draw out new dimensions, and create classification
695 types. Based on rigorous qualitative work typologies have potential conceptual power
696 to provide new insight into underlying dimensions of concepts⁴⁶. There is, of course,
697 a certain amount of subjectivity involved in this analysis, and a different research
698 group might have developed a different typology of perspectives. The typology was
699 influenced by our own prior understandings and sustained engagement with
700 communities working on L&D. We nevertheless endeavoured to accurately represent
701 the perspectives of the stakeholders we interviewed, and also checked our findings
702 with key experts to check whether our interpretation resonated with their own
703 experiences.

704

705 *Stakeholder engagement to refine results*

706 The initial typology was presented and tested in dialogue with ExCom members and
707 observers at the third meeting of the ExCom in April 2016, at the Adaptation Futures
708 conference in May 2016, and with scientific experts and practitioners working on
709 Loss and Damage at the Resilience Academy in September 2016. Experts were

710 asked whether the typology resonated with their own perspectives and experience of
711 others' perspectives, whether we had missed anything, and whether they found the
712 typology helpful. These dialogues resulted in feedback which confirmed the
713 relevance of the typologies, and was used to refine their description, resulting in a set
714 of co-produced understandings, which have evolved through several iterations of a
715 policy brief^{47, 48}, and are presented here for the first time with evidence from
716 interviews and analysis of implications for research and policy.

717

718

719 *Identification of keywords*

720 The analysis of words and their associated meaning is a common tool in social
721 sciences. To identify the words and phrases in Table 1 we focused on stakeholder
722 interviews which resonated most strongly with each perspective, and then revisited
723 the transcripts and codes for these interviews to identify words which were used
724 frequently or emphasised.

725

726 *Mapping stakeholders and political decisions onto the typology*

727 After developing the typology of perspectives, and identifying whether each
728 interviewee represented one perspective well, or spanned multiple perspectives; we
729 then revisited the information we had collected about who these interviewees were:
730 what was their role, expertise, and affiliation. This is not straightforward as many of
731 the interviewees have somewhat hybrid roles. After gathering this information and
732 discussing it in another meeting of the core research team, we identified several key
733 stakeholder groups, including parties and observers to the UNFCCC for which we
734 could identify a stakeholder group, and the extent to which it adopted one or several
735 of the perspectives. This was supported by an analysis of literature, for example
736 including policy briefs by non-governmental organisations, which confirmed that

737 climate justice campaigners were demonstrating an “Existential” perspective, and
738 submissions by parties to the UNFCCC, which confirm elements from range of the
739 perspectives are evident in the recent LDC and SIDS positions.

740

741 To map the WIM and Paris Agreement onto the typology, we analysed the relevant
742 decision texts to identify whether keywords from each perspective were present,
743 what was included and not included, and whether they were organised under
744 adaptation or not.

745

746 *Data Availability*

747 The interview data analysed in this study are confidential and therefore not publically
748 available. Some anonymised metadata, including statistics relating to regional and
749 gender balance of the interviewees, can be obtained from the corresponding author
750 on reasonable request.

751

752 *Ethics statement*

753 This work has been approved by the University of Oxford Central University
754 Research Ethics Committee. All interviewees provided informed consent.
755 Interviewees were assured that interview data would remain confidential, and
756 interviewees would remain anonymous.

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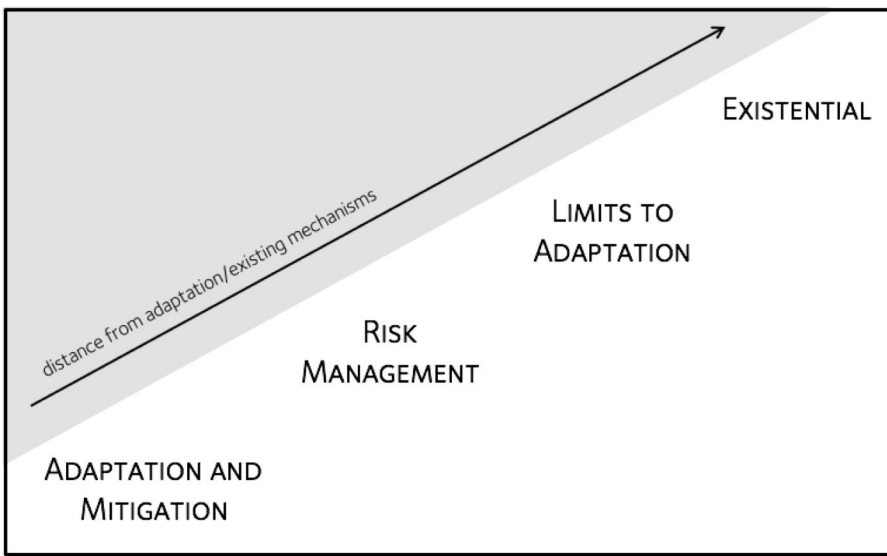
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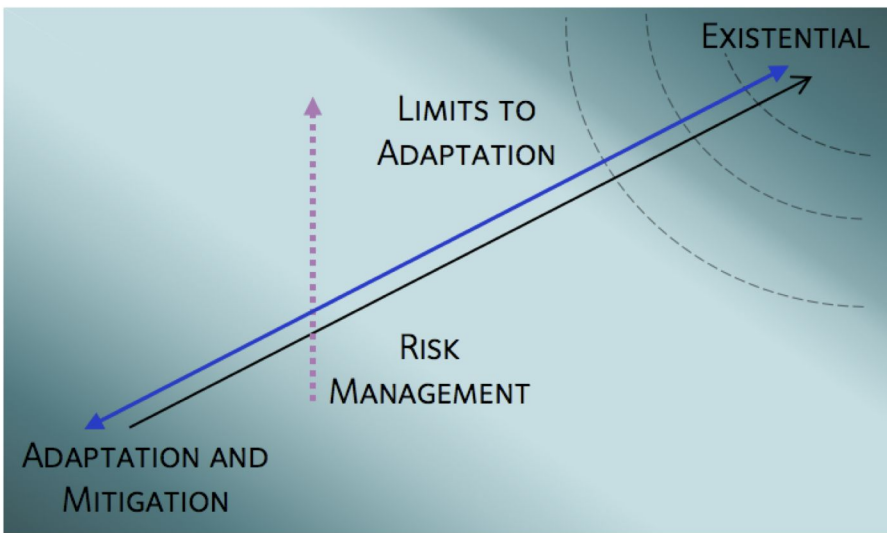
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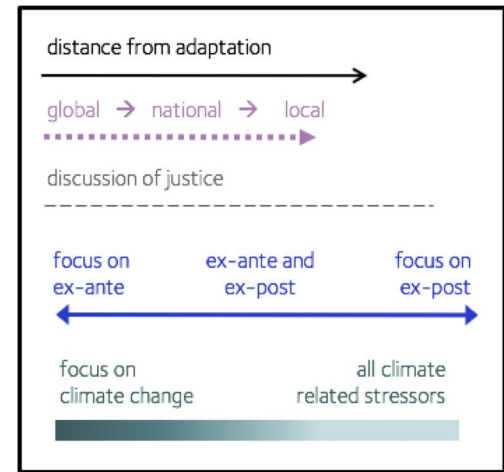
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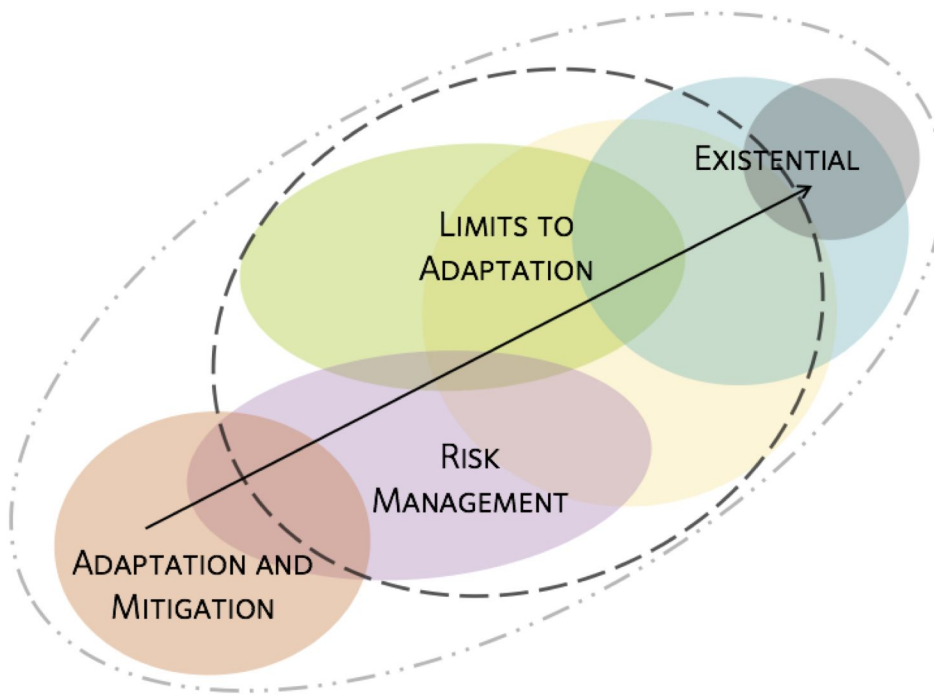
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Points of Distinction



c



Parties

- developed countries
- SIDS
- LDCs

Observers

- climate justice campaigners
- adaptation experts
- disaster risk reduction experts

 WIM

 Paris Agreement