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Climate Change and Loss, as if People Mattered: Values, Places, and Experiences

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Abstract

The United Nations Framework Convention on Climate Change (UNFCCC) is seeking to prepare for losses arising from climate change. This is an emerging issue that challenges climate science and policy to engage more deeply with values, places, and people's experiences. We first provide insight into the UNFCCC framing of loss and damage and current approaches to valuation. We then draw on the growing literature on value- and place-based approaches to adaptation, including limits to adaptation, which examines loss as nuanced and sensitive to the nature of people's lives.

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Complementary perspectives from human geography, psychology, philosophy, economics, and ecology underscore the importance of understanding what matters to people and what they may likely consider to constitute loss. A significant body of knowledge illustrates that loss is often given meaning through lived, embodied, and place-based experiences, and so is more felt than tangible. We end with insights into recent scholarship that addresses how people make trade-offs between different value priorities. This emerging literature offers an opening in the academic debate to further advance a relational framing of loss in which trade-offs between lived values are seen as dynamic elements in a prospective loss space.

Graphical/Visual Abstract and Caption

Figure caption: When experiencing climate change impacts, people judge some of their lived values (what they value in their daily lives) more important than others and hence will try to protect those first or most, including through adaptation, to prevent intolerable loss, both in the present (A) and in the future (B).

INTRODUCTION: LOSS BEYOND THE LIMITS OF ADAPTATION

Beyond the ‘adaptation frontier’, pictured as the limit to adaptation, only two outcomes appear possible — a change in management (transformation) or loss and damage¹. The United Nations Framework on Climate Change (UNFCCC) now addresses loss and damage (L&D) resulting from the negative impacts of climate change. It acknowledges that real limits to adaptation are likely to exist at the interface of climate change and biophysical and socioeconomic constraints². Although there is strong consensus that adaptation will not be successful for all people and all places, how people interpret harm related to climate change from within their own place and culture-specific contexts remains poorly understood.

If adaptation is recognized as an effort to reduce climate-related risks and to protect things we value^{3,4} or to “keep risks to valued objectives [...] at a tolerable level”⁵, then the limits to adaptation are “the points at which adaptation fails to protect things that stakeholders value”⁶. These limits are transcended when there are losses of things that people value and which have meaning to individuals, communities, and entire societies. Given this, the substantive scientific evidence regarding values-based approaches to adaptation can significantly inform emerging scholarship on loss and damage, both methodologically and empirically.

Dow and colleagues⁵ propose an approach that connects valued objects and objectives to perceived risks, building on Klinke and Renn⁷, in order to delineate limits to adaptation by distinguishing between what is acceptable, tolerable, and intolerable. Intolerable risks are defined as “fundamentally threaten[ing] private or social norms —for instance [...] continuity of traditions [...] — despite adaptive actions having been taken”; tolerable risks are those where “adaptive, risk-reduction efforts are required for risks to be kept within reasonable levels”; and acceptable risks those “so low that further efforts in risks reduction (adaptation) are not justified”⁵ (citing ^{4,8}). Efforts to delineate limits through the lens of intolerable risk acknowledge the fundamental role of social, cultural, economic, and environmental values in defining what shapes risks, limits, and losses⁵.

Here we review insights from values-based and place-based approaches to climate change adaptation and their relevance for emerging debates on loss and damage in the UNFCCC. We first provide an overview of the scholarly and policy literature on loss and damage (L&D) and frameworks for assessment, with particular attention to so-called non-economic or non-market L&D. We then

assess the literature on values-based approaches to adaptation which is tightly linked to understandings of place, well-being, and lived experiences. We complement this review with relevant literature on values and what is valued from the perspective of human geography, psychology, philosophy, economics, and ecology, respectively. We identify the boundaries in current debates on values and loss, drawing upon some illustrative case studies. Finally, we offer a heuristic to help explain how people make trade-offs between different value categories and how their preferences may change over time. This interdisciplinary perspective is a fundamental and overdue step toward advancing a meaningful conceptualization of L&D that foregrounds it in what people value in their daily lives and what they deem worth preserving in the face of climate change. It can redirect the core of the valuation debate from biophysical and financial assessments toward people-place relationships and grounded understandings of what losses matter and to whom, considering a broad range of geographic or cultural settings.

LOSS AND DAMAGE: AN EMERGING ISSUE IN CLIMATE CHANGE SCIENCE AND POLICY

Concern about damages, losses, and compensation due to the adverse impacts of climate change have been articulated in climate negotiations for over 20 years, particularly by small islands states⁹. These have led to a recent policy instrument to address “loss and damage” (L&D) in the United Nations Framework Convention on Climate Change (UNFCCC) known as the Warsaw International Mechanism (WIM)¹⁰. The WIM is tasked to investigate approaches for assessing present and future L&D associated with climate change impacts, particularly among vulnerable people in developing countries (which is not to say high-income countries do not also face losses). Of course, the extent to which damages as well as losses can be avoided depends on the effectiveness of mitigation and adaptation efforts¹¹. The establishment of the WIM signals that the UNFCCC anticipates failure in both respects.

The UNFCCC treats “L&D” as a blended concept yet understands losses as irreversible in the sense that reparation or restoration are not possible¹². It proposes that losses be addressed through risk transfer (e.g. insurance) and risk retention (e.g. social safety nets)¹³. In contrast, it considers damages as reversible, through risk reduction, reparation, or restoration. The Paris Agreement (UNFCCC 2015), although devoting an entire Article (8) to L&D in its Annex, was no more specific with respect to averting, minimizing, and addressing climate-related L&D, though it pointedly said that Article 8 “does not involve or provide basis for any liability or compensation”¹⁴. Thus, it forecloses on the option to pursue reparations for ‘residual’ damages due to climate change under the UNFCCC¹⁵.

The WIM recognizes significant gaps in knowledge, including dynamics related to slow-onset and extreme weather events, migration and displacement, and so-called non-economic losses¹⁶. Although a variety of approaches exist that allow for an approximation of loss, “a comprehensive climate ‘L&D’ assessment methodology” is lacking¹⁷, possibly because, as we show, loss is multifaceted and nuanced. With respect to damage, methods for assessment are better understood,

including, for example, pre- and post-disaster assessments as well as the GlobalRiskIndex and analyses of natural disaster hotspots at the global level¹⁷.

In contrast, indirect, intangible and non-economic or non-market losses remain particularly difficult to assess and, therefore, are treated in a distinct action area under the WIM. Losses such as loss of knowledge, sense of place, social cohesion, and identity are neither immediately visible nor readily quantifiable and so are often excluded from loss databases and disaster insurance claims¹⁸. In addition to this accounting bias, existing loss databases overemphasise high-impact events over slow-onset incremental changes that nevertheless have potentially large ripple effects (a threshold bias), and they tend to focus upon densely populated areas over remote areas (a geographic bias)¹³. Only a small number of emergency management entities, such as the Australian EMA¹⁹, attempt to distinguish between direct and indirect as well as tangible and intangible losses such as emotional distress, loss of pets, and changed habitats.

Hence, to address loss the UNFCCC needs improved and robust theories and methods for explaining and assessing loss. Thus far, scholarly attempts to address indirect, intangible, and non-economic/market L&D under climate change have generated illustrative examples, snapshots, category listings, and typologies. They tend to present possible loss categories as discrete entities that appear more suitable for rapid-assessment check lists than carefully targeted policies. This includes the eight types of L&D, each with several sub-types, used by the UNFCCC^{10,20}, others that highlight aspects particular to cultures^{21,22}, and, building upon the above, ten meta-categories of material and non-material as well as intrinsic and instrumental losses²³ (see Table 1). Although these various categorisations speak to some of what people around the world may value, their attempt to meet the universalising demands of the UNFCCC mean they insufficiently recognise more nuanced place-specific and culturally relevant losses, and hence may overlook losses that are likely to be critical for certain groups of people.

For the most part, frameworks for evaluating intangible L&D emulate standard environmental impact and risk assessments, and vulnerability and adaptation analyses. Valuation techniques include composite risk indices, multi-criteria decision analysis, and some qualitative methods^{10,20}. Yet, efforts of valuation — including what is valued — remain entrenched in limiting economic binaries between intrinsic and instrumental value. Science-driven, top-down, end-to-end approaches rely heavily on climate and risk modelling^{12,24} or economic modelling²⁵; yet they tend to overlook place-specific and culturally-subjective drivers of vulnerability and lived experiences on the ground. The only cross-cultural, local-level L&D study so far computes L&D as a residual from negative climate impacts and adaptive measures with no attempt to reveal what is at stake for affected people²⁶.

This methodological and analytical impasse is not surprising as emerging assessments tend to start with climate impacts and then attempt monetary calculations of L&D in order to convert actual or potential harm into costs for risk management, restoration, or compensation. It appears that the dominant discussions around how to address L&D risk repeat the pitfalls so clearly articulated with climate impacts science — a disproportionate focus on distant and discontinuous futures and abrupt changes that are typically at odds with how people themselves view their futures, what they see at stake, and what actions they may take²⁷. Moreover, continuous debates regarding compensation, driven by many developing countries¹⁶ — but without an effective legal framework¹⁵ — risks commodifying incommensurable values²⁸, and ignoring those that cannot be costed, thereby undermining meaningful practices for recovery and renewal.

What is largely missing, then, is a distinctly situated perspective that foregrounds loss in the dynamic, multi-directional, and often contradictory values people hold, and their relationships with the people and places they live in, the meaning they derive from these relationships, even if the places people value are not always local²⁹. Recent scholarly advances in this domain recognize only in passing the merit of a grounded, context-specific lens that makes visible what people themselves value and in turn what they deem to be intolerable outcomes from climate change¹³. Indeed, L&D is intrinsically about values and therefore is socially constructed²¹. What level of loss is considered, is acceptable, and is fair can only be understood within place- and culture-specific contexts, taking into account various levels of power, rather than according to a universal metric of justice, especially when threatened values are incommensurable³⁰.

LEARNING ABOUT LOSS FROM VALUES- AND PLACE-BASED ADAPTATION RESEARCH

Any focus on values in the context of climate change needs to first acknowledge and clarify the often conflated use of the terms ‘values’ and ‘value’ (or what is valued). A distinction between held and assigned values is helpful in this regard³¹: held values are understood as principles or ideas that are important to people³², whereas assigned values are those that people attach to phenomena, be they material, experiences, or opportunities³³. In this formulation, held values are seen as motivating and guiding principles which, at least partially, determine assigned value. This distinction can be characterized as the difference between treating “values” as a noun, that is as a measurable property of a person, as opposed to the process of “valuing” (value as a verb) - what causes people to value certain things or experiences³⁴. It is argued³⁵ that “[t]he more an object or activity has value to us, the more we prefer it over alternative objects or activities we want to possess or protect”.

Understanding values for the purpose of determining loss

The values that people hold influence, but are not identical with, what they value, although the two perspectives are often conflated if not confused. Moreover, what people say they value may not necessarily lead them to act in ways that are compatible with what they value³⁶. Risk assessments that incorporate human choices, values, and cultural preferences attempt to reveal this social complexity³⁷⁻³⁹. In the field of climate risk perception, the role of values is well established⁴⁰⁻⁴³. Such studies differ from probabilistic risk analyses that focus primarily on the likelihood of hazardous events occurring^{8,44,45}.

There are at least five distinct ways the terms 'value' and 'values' are used in climate impacts and adaptation research⁴⁶⁻⁴⁹:

- first, in the economic sense of valuation where people's use and non-use values are translated into market-based preferences, either revealed through behaviour or stated through expression⁵⁰ or value transfer^{51,52};
- second, through the lens of ecology where a distinction is made between the intrinsic and instrumental value of nature⁵³, or more recent approaches that explicitly acknowledge relational values as relationships between humans and non-human actors and humans in dealing with nature, collective well-being, struggles over a good life, and caring for nature as a shared value^{54,55};
- third, from the perspective of philosophy that understands values as part of ethics, as components of moral principles or categories that encompass the notion of a good life, including inherent and intrinsic values and the value of relationships⁵⁶, particularly when coupled with or applied to care ethics^{57,58} and justice perspectives^{59,60};
- fourth, through a psychology lens that views universal human values as guiding principles in life or beliefs about behaviour and what is desirable^{32,24,61,62} and hence guiding adaptive action (see below);
- fifth, values in the sense of what is valued or what is of value in everyday material realities, as a relational construct in space and place, mainly informed by human geography^{63,64}, making visible risk and loss (see below).

Table 1: Typologies of values broadly relevant to explaining climate-induced losses

Universal values (psychology) ³²	Intrinsic values (philosophy) ⁵⁶
<p>Power (authority, leadership, dominance)</p> <p>Achievement (success, capability, ambition, influence, intelligence, self-respect)</p> <p>Hedonism (pleasure, enjoying life)</p> <p>Stimulation (daring activities, varied life, exciting life)</p> <p>Self-direction (creativity, freedom, independence, curiosity, choosing your own goals)</p> <p>Universalism (broadmindedness, wisdom, social justice, equality, a world at peace, a world of beauty, unity with nature, protecting the environment, inner harmony)</p> <p>Benevolence (helpfulness, honesty, forgiveness, loyalty, responsibility, friendship)</p> <p>Tradition (accepting one's portion in life, humility, devoutness, respect for tradition, moderation)</p> <p>Conformity (self-discipline, obedience)</p> <p>Security (cleanliness, family security, national security, stability of social order, reciprocation of favours, health, sense of belonging)</p>	<p>Life, consciousness & activity</p> <p>Health & strength</p> <p>Pleasures & satisfactions</p> <p>Happiness, beatitude & contentment</p> <p>Truth</p> <p>Knowledge, true opinions, understanding & wisdom</p> <p>Beauty, harmony & proportion in objects contemplated</p> <p>Aesthetic experience</p> <p>Morally good dispositions or virtues</p> <p>Mutual affection, love, friendship & cooperation</p> <p>Just distribution of goods and evils</p> <p>Harmony & proportion in one's own life</p> <p>Power & experience of achievement</p> <p>Self-expression</p> <p>Freedom</p> <p>Peace & security</p> <p>Adventure & novelty</p> <p>Good reputation, honor & esteem</p>
Lived values in adaptation ⁴⁶	Non-economic & invisible losses ^{20-23,65}
<p><u>Health:</u> Water & air; Housing quality; Access to welfare; Healthy lifestyle; Mobility, transport & convenience; Infrastructure (water/sewage/energy)</p> <p><u>Safety:</u> Domestic & public; Home ownership; Financial security (income, wealth, affordability); Job security; Business & investment opportunities; Social & economic stability; Access to services; Continuity of place, predictability & confidence; Privacy; Tranquility</p> <p><u>Belongingness:</u> Social interactions; Proximity to others we care about; Sense of belonging; Social harmony; Community dynamism; Community identity, spirit & cohesion; Tradition, history & heritage; Place attachment (home, amenity, sites of significance)</p> <p><u>Esteem:</u> Social status (respect, recognition, reputation, appreciation); Achievement, accomplishment & efficacy; Job satisfaction (employment & training opportunities); Pride</p> <p><u>Self-actualisation:</u> Identity; Freedom & liberty; Spirituality & religion; Enjoyment & pleasure; Recreation & leisure; Aspirations; Citizenship; Access to decision-making; Property rights; Work-life balance</p>	<p><u>Invisible:</u> Culture & lifestyle; Identity; Health; Self-determination & influence; Emotional & psychological losses; Order in the world; Knowledge; Indirect economic losses and lost opportunities</p> <p><u>Intrinsic:</u> Biodiversity & species; Human life; Physical & mental well-being; Culturally important landscapes & sites; Cultural heritage; Territory; Habitat; Human mobility; Dignity</p> <p><u>Instrumental:</u> Productive land; Ecosystem services; Habitat; Social cohesion & peacefully functioning society; Health; Physical & mental well-being; Ability to solve problems collectively; Sovereignty; Education; Traditions, religion & customs; Knowledge & ways of thinking; Indigenous and local knowledge; Identity; Social bonds & relations; Sense of place</p>

While all five perspectives provide contributions to valuation of climate-related losses, most scholarly insights relevant for understanding non-market and intangible loss in the context of climate change adaptation and limits thereof stem from the last two interpretations of value. These two angles, and particularly the fifth, have yielded insights that appear directly applicable to the advancement of the debate on how to best assess what people in specific places value and consider as loss and at what temporal and spatial scale (see 3.2). Table 1 depicts the various categories considered under potentially relevant typologies.

The psychology perspective views values (as a noun) as being closely associated with worldviews and behaviour, or more generally an important source of motivation⁶⁶. This perspective has been applied to cognitive determinants of climate-related risk perception, adaptation, and mitigation^{67,68} as well as to some values-based adaptation studies. The latter includes discussions about value conflicts and potential social limits in adaptation decision-making in Norway, where traditional worldviews clash with modern or post-modern worldviews⁶⁹, as well as underlying values in adaptive decision making among indigenous communities in Canada, drawing attention to intangible and subjective effects experienced through traditions of ‘being the land’, being with it and in it⁴⁷.

Held values are typically considered relatively stable, but do change across people’s lifespan and in response to socioeconomic conditions, generational replacement, and traumatic experiences⁷⁰⁻⁷². People typically adapt their values in response to the circumstances they find themselves in³⁴, i.e. they elevate the importance assigned to values they can readily attain and relegate those whose pursuit is blocked to lesser importance⁷³. However, the opposite seems to be the case when the values concerned relate to material well-being and security⁷⁴⁻⁷⁶. Furthermore, what is important yet not sufficiently valued may only become apparent when it is lost, at times irretrievably⁷⁷. Examples include biodiversity loss and species extinction as well as less visible, more intimate losses that, unexpectedly, materialise as an absence in people’s daily lives.

The human geography perspective understands values (as a verb, or adjective) as “the personal or societal judgement of what is valuable and important in life”⁷⁸. It adopts the notion of the everyday as the locus for experience and change⁷⁹ in order to make visible what otherwise risks being obscured^{80,81} and to preserve and protect what has meaning. This interpretation of value is tightly linked to the geographical world via place identity, place attachment, and sense of place. This latter meaning is employed in the materially-grounded concept of ‘lived values’^{46,82}. It is defined as “valuations that individuals make, in isolation or as part of a group, about what is important in their lives and the places they live in. These valuations may be articulated verbally or expressed through everyday activities”⁴⁶.

Values-based approaches to adaptation

Many studies of adaptation investigate lived experiences through the lens of what people in specific places value and consider both meaningful in their lives and under threat from climate change. Yet, climate change impacts studies often overlook such experiences and understandings as their main focus is on hazards and their consequences^{4,30,83-85}. Albeit predominantly focused on enhancing adaptation, these experience-based studies reveal that cultural and non-material values will underpin many potential losses induced by climate change.

Values-based approaches to climate change adaptation that foreground how people understand climate change affecting what they value and consider worth preserving and achieving in the face of multiple stressors are relatively recent⁸³. These approaches build on earlier insights on adaptation as efforts that allow people to “lead the kinds of lives they value in the places where they belong”⁸⁶. They draw on influential social science research such as value-focused thinking⁸⁷, and its environmental applications. For example, to make ‘invisible’ losses from environmental changes among First Nations more transparent, deliberate processes ought to be taken into account^{65,88}; these include focusing on what matters to the people affected, describing what matters in meaningful ways, making a place for these concerns in decision making, evaluating future losses and gains from a historical baseline, recognizing culturally derived values as relevant, and creating better alternatives for decision making so that invisible losses will be diminished or eliminated in the future⁶⁵.

There is now a growing number of applications of a values-based approach in the context of climate change adaptation, including several in the global South⁸⁹⁻⁹², with indigenous communities^{47,93}, and in affluent nations like Canada and Australia^{46,84,94}. The large majority of these studies rely on qualitative methods that generate rich descriptive data, while only a few have started to incorporate surveys and other methods that generate quantitative data and examine the diversity of values and value priorities between different population strata^{46,47,92}. Methods such as values mapping can make visible where and to whom aspects such as recreation, wilderness, aesthetics, history, spirituality, and biological diversity matter^{84,95,96}.

This body of literature tends to generate lists of what is valued as well as basic values with an attempt to group them according to broader value categories (see Table 1). For instance, Graham et al.^{46,82} examined a range of lived values in areas prone to sea-level rise and flooding in SE Australia. They also differentiated between what people say they value (articulated) and what they do to act upon what they declare to be of value (enacted), mirroring efforts in value clarification and congruence³⁶. Values that indigenous communities in Labrador, Canada, consider under threat from increasingly warm winters, fall into broad categories such as tradition, safety, unity, and freedom⁴⁷. There, land was valued not just because of its inherent capital worth, but also through relationships

people have or used to have through its use and knowledge about it, and through the freedom and pleasure as well as lifestyle and identity tied to the land and seascape⁴⁷.

There are varying levels of specificity and abstractness in identified value categories — e.g. from valuing a particular local ecosystem to valuing the natural environment in its entirety. Yet, assessments are often about the value of a single entity, like place, tradition, or identity and not of the relative valuation of these entities. Also, there appear to be no systematic empirical attempts to assess why values change over time or as a result of social and environmental changes. Furthermore, there is an abundant body of literature that does not explicitly examine values but focuses on lived, place-based, and embodied experiences. These experiences are often implicitly tied to what people appreciate and wish to conserve in the places they call home, and so are also relevant for understanding loss.

Place-based and lived experiences of climate change

Place “is not just a thing in the world.... [it] is also a way of seeing, knowing and understanding the world”⁹⁷. Place gives meaning to people’s lives and attachment to place fundamentally contributes to well-being^{98,99}. As Adger⁸⁵ argues, “place and identity and its relationship to value” form the basis for adaptive decision making and trade-offs between losses and gains.

Initial research on the linkages between place and climate change⁹⁹ drew attention to fundamentally altered ecologies of a place, disruption to place attachment, and the effects of dislocation and displacement on individual and community health. It also highlighted the role of place and social connection for resilience and civic action. A significant number of studies further demonstrate how place attachment, place identity, and sense of place function as vital people-place bonds for climate change adaptation^{30,100-104}.

Place has received particular attention in studies with indigenous populations and climate change experiences, particularly in the Arctic¹⁰⁵⁻¹⁰⁸, often with a focus on place, health, and well-being¹⁰⁹⁻¹¹¹. Well-being in these studies (and beyond) is typically defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”¹¹². For instance, among Inuit communities in Labrador, Canada, disruption of place meanings and attachment, coupled with negative impacts on people’s mental, emotional, and spiritual health and well-being, are testimony to losses engendered by changes in sea ice coupled with dispossession¹¹¹. Among indigenous populations in Alaska and Kiribati, loss of symbolic connections to country, including loss of place, sense of place, and belonging, is seen as significant threats to community survival and has prompted difficult debates around long-term strategies that span permanent relocation, facilitated migration ‘in dignity’, and staying regardless of the tenability of place¹¹³.

However, place and place identity are not only relevant to indigenous, or marginalized societies⁴. Work in British Columbia, Canada¹⁰² and in coastal communities in Norway¹⁰⁴ identifies place attachment as a motivator for and predictor of engagement with climate change and adaptation. Related research on preparedness for wildfires in Australia¹¹⁴ and floods in India¹¹⁵ shows that the strength of people's bonds to place predicts their willingness to take place-protective actions in the face of perceived threats.

As part of a distinct focus on place and well-being, situated adaptation research increasingly emphasizes the notion of the everyday, or lived experiences in everyday lives (see Table 2). People find meaning to their lives, the places they live in, and their well-being, not in an abstract space or time but in their day-to-day activities, encounters, and engagements. Feminist social science has long shown that the scale of the daily life - the everyday - can make invisible practices such as caring visible to analysis and decision making^{63,80,81}. In the context of climate change, a focus on the everyday allows individuals and communities to identify what is important to them, as well as that which

Table 2: Examples of threats to lived values due to slow- and rapid-onset climatic events

Climate driver	Region	Value at stake	Description	Case studies
Drought	Australia (family farmers)	Identity	Rural cultural mores (i.e. stoicism, resilience and endurance) inform personal responses to hardship Attribution of blame for failing farm productivity and upkeep, negating help-seeking Feelings of hopelessness and helplessness; violation of 'the good farmer' identity; social isolation	118,119, 121-123
		Health	Elevated rates of clinical and non-clinical psychological and physical illness Increased alcohol and substance abuse, increased domestic violence Financial and emotional investment in identity, place, and livelihood at the expense of health (incl. suicide)	
		Place	Reduced agricultural production and profitability affecting place dependence Threats to symbolic and emotional values of farm landscapes; feelings of grief, loss and distress (e.g. solastalgia) Outmigration, reduced sense of community, social cohesion and social capital; isolation	
	Ghana (subsistence farmers)	Identity	Eroded personal identity and human dignity as people have to drink from the same water source as animals Loss of familiar and flourishing landscapes and subsequent losses to personal identity as dryland farmer	124
		Place	Declining agricultural productivity and profitability; water scarcity; deforestation Loss of sense of place and attendant feelings of grief, sadness, frustration, anger and depression (solastalgia) Outmigration of younger family members, reduced social networks in place, decline in collective action	
Sea level rise, flooding, ice loss & coastal erosion	Australia (coastal residents)	Identity	Threats to generational continuity, satisfaction and attachment to the familiar, family traditions, independence	46,94
		Place	Threats to peacefulness, scenery, closeness to family, sense of belonging, being a valued community member	
		Health	Enduring the inevitability of floods, accepting social isolation and inadequate access to health care	
	Canada (Inuit communities)	Identity	Threats to traditional hunting activities and personal identities and roles; erosion of traditional ecological knowledge and associated relationships to people and places	47,106, 107,109-111
		Place	Decreased sea ice quality and stability leading to attendant threats to traditional lifestyles and activities, feelings of safety, freedom of movement, and access to culturally significant	
		Health	Decreased access to traditional foods and increases in associated dietary-related health ailments; threats to mental, emotional and spiritual wellbeing	
Extreme rainfall events & flooding	Belize (coastal residents)	Place	Loss of recreational ground, sandy beaches; loss of land and houses; reduced opportunities for tourism	92
		Culture	Risk to cemetery and other sacred sites; reduced social cohesion due to affected social activities	
		Health	Emotional toll due to losing homes, relocation, threats to continuity of place, reduced horizon of expectation	
	United Kingdom (urban residents)	Health	Physical health impacts (cold, flu, contaminant exposure, gastrointestinal illness, skin irritation, joint soreness) Acute and enduring psychological impacts (e.g. shock, anxiety, stress, insomnia, mild depression)	125,126
		Place	Violation of home; loss of sense of security; disrupted place identity; anxiety about potential future floods	
		Community	Feeling 'isolated' from non-affected residents: psychological distance, reinterpretation of 'insider-outsider' status Loss of trust and confidence in local authorities	
Bushfire	Nigeria (urban women)	Place	Destruction of homes and attendant loss of privacy, livelihood activities and 'sense of peace'	127,128
		Health	Reduced access to clean water; unsanitary living conditions Heightened concerns for children's' health and wellbeing (e.g. exposure to contaminants; risk of drowning)	
		Security	Increased risk of evictions; failure to follow early warning as a result of protecting belongings and place	
	Australia	Place	Losses to home, possessions, livestock, surrounding natural environment Disruptions to place identity and place attachment, feelings of unsettledness, grief and loss Relocation seen by some as necessary to maintain marriage	129-131
		Health	Initial trauma and enduring psychological distress (e.g. depression and post-traumatic stress)	

is produced and reproduced through daily practice⁴⁶. It provides a glimpse into how people make sense of their often messy situations and distil experiences across a variety of scales to extract meaning for their daily lives⁹⁴. Such a focus on daily lives also highlights how uneven power dynamics, including the micro-politics of adaptive decision making^{94,134}, determine whose values, aspirations, and priorities are noticed, deliberated, and ultimately considered. By extension, explicit attention to authority and the making and unmaking of ‘vulnerable’ and ‘resilient’ subjects¹³⁵ would reveal that not everybody’s loss matters, or matters equally. Some people’s voices and experiences may either be deliberately omitted as irrelevant or their loss **viewed as acceptable and hence to be endured**.

Attention to lived experiences foregrounds the ways people ‘dwell’ in places and landscapes and establish relationships through their daily encounters — intertwined with culture, history, and affective connections to the land, non-human species, and the weather and climate around them. It offers an alternative entry point to frequently detached scientific assessments of climate impact studies¹¹⁶ as well as policy discourses on adaptation priorities. Moreover, such grounded insights, including the timeframes people attach to their sense making and their future visions, appear distinctly more suitable for generating an appreciation for the level of risk and potential loss people can live with than what scientists or policy makers prescribe as urgent priorities or dangerous futures^{94,117}. For instance, the lived experience of and day-to-day wrestling with the ten-year drought among Australian farmers produced striking narratives of endurance and perseverance, of rugged farming identities rooted in land, place, and livelihoods, and the desire to hold on¹¹⁸⁻¹²², all of which were rather at odds with governmental discourses of disaster management and drought policies.

Engaging with loss

The broad consensus from studies on place and climate change, following Fresque-Baxter and Armitage¹⁰⁰, is two-fold. First, external stressors, including environmental and climatic changes, can threaten not only a place but also the affective experiences, daily practices, identities, and social relationships bound up with those places, potentially resulting in stress, loss, grief, hopelessness, and alienation, ultimately affecting health and well-being. Second, strong place relations, place making, and shared values and identity can promote a sense of community, enhance well-being, and potentially be a key determinant of adaptive capacity^{78,134-136}, or give in to denialism, apathy, or employ mal-adaptive strategies¹³⁷⁻¹³⁹. At the core of this bidirectional linkage between place and well-being is people’s needs, and their right, to have “some locus of control over their destinies as part of a recognition of identity and place”³⁰.

This recognition of people’s agency with respect to their own destiny is also relevant for situations of loss as agency forms the basis for pre-emptive engagement with loss^{140,141} and narratives of transience as used in anticipatory histories¹⁴²⁻¹⁴⁴. Places and landscapes in this literature are

understood as dynamic and transient, always holding the potential for renewal and new responsibilities, and the possibility of letting go and consciously working through stages of pain, anxiety, disorientation, loss, and grief. The notion of “place detachment”, used in the context of managed retreat as a consequence of climate change¹⁴⁵, incorporates such anticipation of possible futures; yet, it complements it with “intentionally loosening existing attachments and forming new ones elsewhere”, an untangling from a current place while imagining and embracing a new existence and identity in a different place¹⁴⁵.

Engagement with loss has also become more prominent in scholarship on affective aspects in (restoration) ecology and efforts in assessing environmentally-induced distress in radically transformed places (‘solastalgia’)^{124,146-148}. Hobbs¹⁴⁹, applying the five-stage loss model from psychology¹⁵⁰ to conservation losses and physical disappearance of trees, wetlands, and species, argues that clashes in restoration efforts are not only due to differences in people’s values but also to different stages in their grieving process. Expressions of grief and mourning amongst people experiencing loss as a result of ecological or landscape change indicate the possibility of an ‘ecological grief’¹⁵¹⁻¹⁵³. At the same time, creative and artistic engagements with loss, for instance through writing, music, and performances, provide the needed affective space to *feel* grief for what we are about to lose while overcoming growing notions of hopelessness¹⁵⁴⁻¹⁵⁶.

THE CHALLENGE OF VALUE TRADE-OFFS

Fluidity and connectedness between value dimensions

This overview of the literature, as well as gaps therein, suggests that any nuanced assessment of loss and damage in the context of climate change ought to take into account the following four propositions:

- 1) What is valued and potentially at risk of intolerable loss is highly context-specific, may not be considered rational or significant by others, and can only be understood through situated analysis with people at risk;
- 2) Relationships are central to value, including people’s relationships with each other that are often bound up in local places, as well as people’s relationships with the environments they live in and cultures they identify with;
- 3) People’s choices about what is to be saved and what can be lost will entail trade-offs among valued things that may change over time and with new information, and which will not follow universal laws and hence cannot be predicted by expert systems;

4) Whose losses matter and whose don't, whose losses are judged acceptable or unacceptable, and whose losses are taken into consideration in decision-making processes is subject to complex and contested power relations, from the level of households all the way to international negotiations.

These propositions draw attention to the fluidity and connectedness between lived values that are relevant to actual and potential losses under climate change. The literature suggests that understanding this interconnectedness and fluidity in what people value, whether these values are heard and respected, and what may be at stake from climate change is imperative in order to overcome the limitations of rigid and static typologies and binaries between economic/market and non-economic/non-market aspects of loss so far presented in discussions on L&D. This is particularly the case when most categories of things that are valued (value dimensions) are incommensurable, as shown here, although it does not preclude the possibility that they also have an economic dimension (for example the role of markets in livelihoods, or the market value of land). Adopting a distinctly more dynamic understanding of lived values and potential loss is relevant at three levels.

First, damages and losses resulting from climate change may unfold sequentially, or all at once. For instance, losses in food production may affect incomes, then nutrition, then cause forced migration, leading to adverse health impacts, community dislocation, erosion of identity, and loss of place. Thus, such gradual losses tend to accumulate, with profound impacts on individuals and communities, sometimes over generations⁶⁵. In contrast to slow emergencies and sequential loss, impacts from rapid-onset events such as floods or hurricanes may amplify interacting and overwhelming losses, triggering in victims a 'sense of panic' and a 'mode of existential threat'¹⁵⁷ or a 'cascade of sorrows'¹⁵⁸, often with severe negative psychological consequences^{126,159,160}.

Second, people hold multiple values and more than one may be at risk from climate change. Yet, only a small number of studies have attempted to examine the various trade-offs people are likely to make between the lived values that are important in their lives and livelihoods. For instance, Karlsson et al.⁹² describe tensions among coastal residents in Belize between what is considered worth protecting and what people are willing to sacrifice in order to gain something else. For the majority, the prospect of losing valued aspects of living in a precious place is acceptable for the sake of more job opportunities elsewhere while, for others, moving away would mean intolerable harm to their well-being. In the case of elderly residents in flood-prone coastal areas in SE Australia, wanting to remain in a familiar albeit 'at-risk' place takes precedence over closer proximity to health care facilities⁹⁴. Elderly residents in the UK downplayed heat stress risks during the 2003 heatwave, consciously trading off the possibility of ill-health with their entitlement to live independently, as capable rather than frail citizens¹⁶¹. The drought cases in Australia perhaps most powerfully convey the personal emotional and physical hardship men and women farmers endure to maintain their identity and subjectivity as 'good farmers' as commanded through cultural and policy discourses of pride and resilience (see Table 2).

Third, if understanding the potential trade-offs at a single point in time is limited, knowledge of trade-offs over time is even more constrained. Each generation has new cultural influences, information, political and economic circumstances, and technologies that lead them to change what is valued and what is seen as preferable. Climate change may itself be a kind of litmus test of values: some things at risk may become less valuable given the risk of their loss (and so their demise may transform to be something less than a loss), while others become more valued given their increasing scarcity. Though challenging, some investigation of future changes in value may be helpful in guiding present day decisions about adaptation to avoid losses, but current analyses have not done so as they are essentially snapshots in time. Approaches that use scenarios and visioning the future may help identify how values and what is valued might change in the future.

A relational framing of value trade-offs

One promising approach to address trade-offs in value-based studies of loss and damage due to climate change is to expand on particular aspects of a relational theory of risk³⁹ and examine more closely the dynamics underlying people's prioritization of what they consider at stake and worth protecting. This theory draws upon a conceptual understanding of risk inspired by science and technology studies³⁷, and has three elements: an object that causes risk, a putative harm or object at risk endowed with a value, and a relationship of risk. All three are social constructions and linked to each other. The usage of the word 'object' is broad, including phenomena, cultural artefacts, and social behavior. For our purpose, these three elements can be equated with a climatic hazard, threatened lived values, and trade-offs regarding what to prioritize and protect from looming loss. Relationships of risk are "expressions of cultural preferences" based on an actor's capacity to assess, decide, and act in order to prevent harm, and hence are socially constructed³⁹. It is a basic human trait to differentiate, categorize, and prioritize events, objects, processes, and ways of being in space and time³⁹.

Two aspects about this relational conceptualization of risk—and, by extension, loss⁹²—are worth highlighting. First, it is not only the object at risk (the lived values) that requires attention but the relationship a decision maker establishes between a threat and a potential loss, based on how much value is endowed to a certain thing or objective, in relation to other aspects that a person may value. This relational space is the socially constructed arena in which prioritization and trade-offs are made, i.e. what people consider acceptable, intolerable, essential to conserve, or possible to relinquish. Second, configurations of these three elements change over time, depending on both actions undertaken and new external drivers; they are "continually reframed and redefined"³⁹. A range of methods, from modelling to narratives, can be used to explore how these causal relationships shift, yet the ultimate purpose is to "look at value before looking at threat"³⁹.

A relational approach to value trade-offs that adopts a dynamic lens of what is at stake matches the call for a ‘science of loss’¹⁶² that starts with what people value, rather than potential climate impacts or limits to adaptation while expanding the analytical scope to often conscious trade-offs people make to “keep risks to valued objectives at a tolerable level”⁵. In other words, it reveals what actual and potential losses matter and to whom, foregrounding otherwise obscured cultural, embodied, and symbolic dimensions. It also reveals that value trade-offs rarely occur in a power vacuum; rather, decisions over whose values count and are worth acting upon are embedded in complex and contested webs of authoritative ruling^{132,133}. Moreover, this relational approach bridges the gap between important insights on people-place relations in adaptation studies and an urgent scholarly and policy need for assessing what may count as loss⁹².

A deeper understanding of people’s value trade-offs and struggles for a good life can also inform the ways the concepts of adaptation pathways^{163,164} and adaptation tipping points¹⁶⁵ are designed and used in practice. Both notions suggest that, over time, certain adaptive strategies will no longer be effective and need to be replaced. Pinpointing triggers and tipping points that matter to people and hence are socially-salient is particularly important as they signal unacceptable impacts on people’s daily lives and provide a sense of ownership over local narratives and trajectories¹⁶⁴. A pathways approach that pays explicit attention to the decision context in which values, rules, knowledge, and power intersect¹⁶⁶ opens space for identifying what value trade-offs particular groups of people make at any junction along their pursued vision, considering new information (i.e. climate projections), new adaptation options, and changing climatic trends or events. Furthermore, it would be helpful to identify when and why people give in to denialism or apathy, or when they employ mal-adaptive strategies¹³⁷⁻¹³⁹.

Figure 1 is a heuristic explaining this relational framing of loss. It highlights what is at stake for people at distinct points in time, the potential for adaptation to reduce loss, and deliberating trade-offs between choices of what to preserve and what to let go. It describes a “loss space” that is graded according to severity of potential loss, moving from “intolerable loss” in the top right to “tolerable loss” in the middle and “acceptable loss” in the bottom left, as determined by the intersection of valued objects and climatic hazards and their impacts. When an object is highly valued and significantly threatened by climate change the risk of loss is high, but when the climate threat and/or the value is lower, the risk of loss is diminished. This notion of a loss space acknowledges that loss can occur anywhere and anytime in people’s lives, but not all losses matter, or matter equally. It also acknowledges that adaptation can potentially reduce the risk of loss, or even convert a potential loss into tolerable or acceptable damage, as can changes in values.

Figure 1: The loss space with trade-offs of lived values (what people value in their daily lives) along the horizontal axis and adaptation efforts to reduce looming loss from climate change and other stressors. A) perceived or experienced loss under current/observed climate change; B) potential loss under future climate change with shifts in lived values trade-offs due to new circumstances.

This heuristic highlights that any attempt to assess loss in the context of climate change requires close attention to what people ultimately value, how much they are willing to tolerate, what they are ready to relinquish, and, ultimately, whose values are considered and excluded in decision-making processes. Unlike existing categories and listings of loss and damage (L&D) that remain focused on entities at risk, including those considered invisible and intangible (see Table 1, bottom right), this approach brings to the fore how people juggle various lived values, how they value some more than others, and how they attempt to protect those things they value most from potentially intolerable loss. Successful adaptation can convert an avoidable and intolerable loss into damage that people may accept as tolerable or even acceptable. Yet, once the threshold “where adaptation fails to protect things people value”⁶ is crossed, irreversible loss occurs. Table 3 shows two cases of trade-offs regarding identity and well-being where present ways of life may not be sustainable given high rates of warming and associated impacts.

Table 3: Examples of possible choices and value trade-offs to address looming loss

Australian family farmers dealing with drought	South Pacific atoll communities dealing with sea level rise
<p>Farming families in western and southern Australia face difficult trade-offs, juggling droughts, higher temperatures, and neoliberal agricultural policies:</p> <ul style="list-style-type: none"> ➤ Leaving the farm and engaging in emotional place detachment^{121,140,145} where loss is transformed to something less devastating; ➤ Staying in place, persevering, and “gearing up to endure more”¹¹⁸, with potential costs to personal wellbeing and family relationships¹²³; ➤ Embracing a globally-engaged and business savvy farmer identity with potential gains and acceptable losses¹⁶⁷; ➤ Committing suicide when loss is unbearable^{119,122}. 	<p>People living on atolls in the South Pacific face difficult intertemporal trade-offs among highly valued aspects of life:</p> <ul style="list-style-type: none"> ➤ Existing population levels and people’s basic needs can be met given extensive land reclamation and coastal defenses (Majuro), desalination and rainwater harvesting (Funafuti), and extensive food imports (Tarawa), though at the cost of long standing material cultures, lifestyles, and psycho-social well-being¹⁶⁸; ➤ Resettlement, which may lead to improvements in material well-being, but even larger costs to culture, identity, and psycho-social well-being¹⁶⁹.

This framework can be used to guide processes to assess loss or risk of loss in three steps. The first step is to assess and prioritize lived values in a place-based setting (see Table 1) along the horizontal axis, and then to determine how significantly these lived values are affected by climate change, in the present (Figure 1A). Though easier said than done, some helpful approaches and methods are proposed in the studies reviewed in this paper. Such an ordering will position these lived values across the loss space, providing a first crucial glimpse into what matters to people, how they approach trade-offs, and which values they consider most at risk and hence worth protecting. In Figure 1a, a hypothetical individual or a group may decide to prioritize preserving their livelihood and the identity attached to it, at the expense of their own health.

The second task (Figure 1A) is to examine adaptation options and how adaptive action (yellow arrow) shifts the lived value into a different position within the loss space. Following Dow et al.⁵, adaptation is understood as “an attempt to keep risk to valued objectives [including assets] at a tolerable level”. This entails explicit attention to the ‘micro-politics’ of adaptive decision making¹³².

The third and final step (Figure 1B) is to consider how the positioning of lived values across the loss space is likely to change over time, anticipating future climate change in a 1.5°, 2°, and 4°C warmer world, as well as access to more or better information on likely climate futures, available and conceivable adaptation options, and shifts in political agency. In the graphic example, a social actor decides to opt out of farming and adopt a new livelihood and identity in a less climate-sensitive

domain, moving to the city, yet is acutely concerned about her deteriorating health due to urban heat stress.

Although representing a significant empirical effort, the findings from this review indicate that static typologies of what individuals, groups, and societies deem to be of value underrepresent both the complexity and fluidity of their lived values and the likely power struggles of whose potential losses matter or matter most when dealing with climate risks. The relational heuristic and the steps outlined above sketch a research agenda that addresses the emerging nuances involved in assessing climate-induced losses. Such a research agenda allows locally-held values to be incorporated into decisions both about adaptation (to reduce loss and damage) and around reparation and its nature, including contradiction and paradoxes in difficult decision making processes.

CONCLUSION

This review of the growing body of evidence from people-place studies of climate change adaptation provides important insights to the meaning of loss and damage as proposed by the UNFCCC. It reveals how people experience climatic hazards (as well as a whole suite of other stressors), how they articulate their needs and priorities, and how they choose among them, irrespective of what others may consider to be rational or 'dangerous'. It is through attention to and appreciation for what is meaningful to people that incommensurable needs, values, and often difficult trade-offs can be revealed⁸⁵. Some of these trade-offs are the product of entrenched power asymmetries, from the local to the global, and may well force individuals, communities, and entire societies to decide between a set of sub-optimal or least desirable outcomes. This reality requires acknowledgement that there may be less valued things that people would like to preserve but would forego to preserve in order to save a more valued object or objective.

This paper highlights that predefined risk assessments and existing methods to assess so-called non-economic loss cannot adequately reveal what matters to people in their daily lives, neither today nor in the future. What individuals and societies value and perceive as loss will "rely on perceptions and representations of the world around us"⁷⁸. An explicit focus on value- and place-based decision making processes through rich, descriptive accounts can help to better assess potential loss, particularly from slow and incremental climate threats, while respecting people's own visions for the future and how they want to engage with unavoidable loss. Such a value-driven lens holds great promise and requires a committed actor-centered research agenda that takes as its starting point people's thinking, emotions, decisions, and actions.

Further advances in knowledge about loss require detailed comparative analyses to distil emerging patterns across cultural and geographic contexts. A more concentrated effort is needed to assess difficult value trade-offs and shifts in what is valued over time. The ultimate goal is to allow

vulnerable communities, researchers, practitioners, and policy makers alike to identify where to concentrate efforts in risk reduction, risk transfer, adaptation, and restoration, where to scale up successful adaptive action, and where to learn to accept that not all that we value may be preserved.

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