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A Critical Reading of Solastalgia Through Indigenous and Care Ethics Lenses

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ABSTRACT

Solastalgia is the emotional response elicited by ecological degradation, originating from the concepts of solace, desolation, and pain. Climate change has profound societal and health impacts especially for marginalised communities who face food shortages, poverty and forced displacement. Indigenous peoples have deep relational ancestral connections with the land that are beyond connection to place, and experience unique intensified forms of distress resulting from environmental degradation. For Indigenous peoples, connections with land are disrupted through extractive politics such as colonisation and now climate emergency, legacies that leave deleterious effects on wellbeing. In collective Indigenous cultures, distress is embedded within wider contexts of community, history, and the earth itself. This paper critically reviews solastalgia from Māori and care ethics perspectives to demonstrate the power of adding relational, contextual, and embodied elements to the concept. This paper argues for the incorporation of Indigenous knowledge in the conceptualisation of climate-related distress. Māori notions of voice and place inform research approaches that are in solidarity with Indigenous voice to examine the impacts of climate degradation.

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Introduction

Climate emergency is the health priority of our times (Crane et al. 2022), due to environmental destruction in rapidly changing ecosystems. Climate emergency intensifies health inequities (Aylward et al. 2022). For Indigenous peoples, relationships with land and place influence health and wellbeing. In colonised societies, health systems that do not accommodate Indigenous ways of thinking and doing result in ineffective understanding and consequently an inability to enable wellness for Indigenous peoples, contributing to

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health inequities. For Indigenous communities who are routinely marginalised in colonised societies, wellbeing (for Māori, Hauora) is inextricably linked with connection to the whenua (land, and placenta) (Lebel et al. 2022) and degradation of the land is therefore inextricably linked to distress. Recent mental distress taxonomies identify eco-anxiety, ecological grief and eco-guilt (Ágoston et al. 2022; Caceres et al. 2022; Cunsolo et al. 2020; Cunsolo and Ellis 2018) as responses to the overwhelming nature of the scale of climate change, and the personal responsibility to take action to prevent or slow further climate degradation. In this paper, we focus on the concept of solastalgia (Albrecht, 2019), which is the deep distress experienced as a reaction to environmental degradation including climate change.

The profound spiritual connection that Indigenous peoples have with the land is not merely a facet of Indigenous life; it is its cornerstone. This connection, embodied in collective emotions that transcend individual experiences, reflects a complex web of relationships that bind communities to one another and to the earth (Mesquita 2022). Emotions within these cultures are a product of shared existence, collaboratively shaped within a cultural framework that extends to the more-than-human world (Haraway 2016; Mesquita 2022). Expressions from various Indigenous cultures capture dislocation from natural harmony, for instance, the Hopi term 'koyaanisqatsi' articulates profound disequilibrium brought about by industrialisation, a feeling shared by communities worldwide facing environmental changes (Albrecht 2019). Similarly, the Inuit word 'uggia-naqtuq' used to describe unpredictable behaviour, including in the weather, reflects the deep and personal rapport the Inuit maintain with their environment, indicative of a world where non-human elements are sentient beings (Albrecht 2019). These insights reveal that Indigenous peoples have long possessed a nuanced understanding of solastalgia; a visceral sense of loss when the land that is part of their very identity undergoes profound and unwelcome change.

Central to Māori understanding of solastalgia is kaitiakitanga (guardianship) which is a collective responsibility for action to preserve and protect all aspects of life. From an ethics of care perspective, Tronto (1993; 2013) notes privileged irresponsibility as the option to renege responsibility for change, as seen in latent political and individual responses to the climate emergency. Diversion from collective action to the individual is a hallmark of neoliberalist and capitalist ideologies, extensively critiqued in the ethics of care literature (Tronto 1993, 2013). Indigenous worldviews and care ethics recognise multispecies, intricate interdependencies of all life forms and the Earth. It confronts the Anthropocene's anthropocentrism, consistent with Haraway's (2016) Chthulucene which shifts from human-centrism to a more inclusive, symbiotic understanding that is fundamental to Indigenous thought. The Chthulucene invites us to embrace holistic approaches that recognises the collective influence of all life on the environment. For Māori, there is no distinction between land, flora, fauna and people, early proponents of post-human approaches. Thus, we endeavour to move beyond the anthropocentric constraints of contemporary discourse, fostering a broader comprehension of the complex emotional terrains that Indigenous communities navigate amidst ecological degradation. These theories provide a lens through which the literature about solastalgia is reviewed.

In Aotearoa, Indigenous people are Tāngata Whenua (people of the land), but to translate Tāngata Whenua as people of the land is to miss the embodied, and spiritual meaning

within a world view that is not separate from the land. For Māori, whenua is tūrangawae (standing place), we are responsible as its kaitiaki (guardians), our tikanga allows us he whakaaro kāinga tika (a righteous sense of being at home) (Jackson 2022). A Māori worldview insists that everyone who calls Aotearoa home understands what is right and appropriate in the kaitiakitanga (guardianship) of this land (Jackson 2022). As kaitiaki (guardians) of the whenua (land), Māori are holders of mātauranga (knowledge) that sustains whenua (land). Māori knowledge foregrounds guardianship of the land through exquisite knowledge of ecosystem interactions, such as the maramataka (a lunar guide to activities to grow and gather food) and rongoā (traditional therapies). This Indigenous holistic understanding can be thought of as numerous symbiotic relationships, a figure strung between tāngata and whenua as interconnection – with tensegrity we hold the land in a relationship of care, we sing our stories into it, the land then holds us in mutual flourishing (Kimmerer 2013) in interdependence. Having intricate land management practices which avoid exploitation, Māori ways of working and knowing offer different opportunities for progress for climate action (Haraway 2016).

This paper also draws on the Ethics of Care (Gilligan 1993; Tronto 1993) which echoes the Māori concern of seeing people as a collective part of an ecosystem, and to take responsibility to care for the planet and people, taking a meshed approach that removes the boundary of people and place to see responsibility for climate action as both local and global. Care theorists are examining the climate emergency through a care lens (Flower and Hamington 2022). Ethics of care is useful as a guide to consider how voice is central to the construction and production of evidence (Brannelly 2018; Brannelly and Barnes 2022). It is this lens that we bring to the critical reading of the literature. This provides an opportunity for comment about how Indigenous knowledge, can inform climate-emotion work and why it needs to be central to research and practices in colonised and coloniser societies.

Positionality

Academic positionality is akin to Haraway's concept of string figures, which represents a dynamic and intricate interlacing of personal, cultural, and intellectual narratives, each thread contributing to the complex patterns that shape our understanding and approach to scholarship. 'It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with' (Haraway 2016, 12). This work sits at the intersection of Indigenous knowledge, environmental psychology, and ethics of care so it is helpful here to let the reader know how we got here.

Eridani is a Māori academic of mixed Kāi Tahu and Irish descent. Ko te pā o Moeraki te tūrakawaewae, though displaced via colonisation my father spoke of the soil at Moeraki intertwined with the bones of our tīpuna (ancestors). I find myself at an intersection of cultural identity and environmental advocacy. The gradual erosion of our urupā/burial ground due to climate change is not just a loss of land; it is a diminishing of a sacred connection, one that has sustained and nurtured our people for generations. This erosion is not only physical but also symbolic, representing a deeper more profound impact on my identity and health. My father spoke about the healing power of kai/food grown on other parts of our whenua /land, he believed that ancestral karakia (incantation) whispered to our food as it grew, imbued it with healing properties. This deep-rooted belief in the

interconnectedness of our health, identity, and the land forms the backbone of this work. The aim of this mahi/work is to explore the meaning of solastalgia for Indigenous peoples, in the context of the current climate emergency. From this position, this work is akin to a string figure we have crafted together, embodying the ethos of ‘thinking with,’ a concept I draw from Sara Ahmed’s approach to engaging deeply with ideas and theories (Ahmed 2021). This method of intertwining perspectives resonates profoundly, particularly in care ethics as articulated by Joan Tronto. Initial engagement with Tronto’s framework was through the insightful interpretations related to research (Brannelly and Barnes 2022) These pillars of care ethics – attentiveness, responsibility, competence, responsiveness, and solidarity known as the integrity of care (Tronto 2013) – are not just theoretical concepts but guiding principles that I actively integrate and ‘think with’ in reviewing this literature. This approach responds with care informed by Te Ao Māori knowledge, a practice informed by the collaborative ethos of ‘thinking with,’ so this endeavour, underpinned by an ethic of care, not only respects but also integrates Indigenous knowledge and practices. This commitment reflects a holistic and inclusive understanding of these interrelated issues, mirroring the interconnected and collaborative approach championed by both Ahmed and Tronto.

David (DJ), Waikato and Ngāti Maniapoto tribal affiliations, is a Māori academic in Mātauranga Māori, tikanga and is a tōhunga (traditional Māori healer), a Rongoā and mirimiri practitioner and researcher. He has worked in various roles connected to the preservation of Māori knowledge, for example, in library archiving. He became a tōhunga through extensive knowledge gathering that includes herbal remedies used as medicine and in therapeutic massage. Connections to place are significant in healing practices for Māori, not only to gather the plants required for medicine but also in spaces which promote healing. An example is how a person in mental distress may be brought out to the bush and treated with traditional medicine, massage and chanting. David has trained many others in traditional Māori healing practices and campaigned for Rongoā to be offered alongside Western medicine for Māori, not only through Kaupapa Māori services, but in non-Māori services as well. More recently, he has turned his attention to research to examine the impacts of traditional medicine, and tertiary education for health workers. His role in this project was to add to the conversation about the role of whenua in health and the depth of relationship that Māori have with their whenua, and the impacts of the loss of whenua on health. DJ and Eridani discussed in depth how to present the Mātauranga (knowledge) in this article, what is constituted as public knowledge, what needed to be checked with the holders of that knowledge and how to uphold the integrity of that knowledge.

Tula is of Irish heritage who grew up in UK and migrated to Aotearoa in 2006 and has a longstanding interest in care ethics. Colonisation had a devastating effect in Ireland, and the restoration of culture and language have gained momentum in recent years. I am the first generation not to speak Irish, but see how my thinking is Irish, valuing interconnectedness and a deep, detailed, understanding of nature and relationships which are ancestral, embedded, and multispecies (Magan 2024). The ethics of care echoes this connectedness and identifies marginalisation with a feminist concern for social justice through care. I first read it when studying for a PhD about citizenship for people with dementia, and how people are included or excluded from care decisions when placed in permanent care situations. I came to care ethics through Sevenhuijsen’s work and then to Tronto and Gilligan. Value for interdependencies and relationality rather than

independence and autonomy, or care rather than control, was the focus I had sought but been unable to articulate until then. This paper provides an opportunity to turn that thinking to climate emergency and distress, and how to think differently to find solutions, and how thinking differently helps emotional, physical situated selves to respond. This paper offers a way of thinking for climate impact research to learn from Indigenous knowledges, and how implementation is in solidarity with Indigenous peoples' priorities.

Taking these three positions as a strengths-base for the examination of solastalgia enabled a discussion about what Māori knowledge and care ethics offer the conceptualisation of climate-related distress. More importantly, there was careful consideration of what is or is not ours to share, what remains the property of hapu and iwi (tribes). We have sought out discussions with others to help make those decisions.

Solastalgia

Solastalgia (Albrecht 2019) is emotional response elicited by ecological degradation, originating from the concepts of solace, desolation, and pain. Solace denotes the alleviation of distress in this case through contact with nature, desolation refers to abandonment or loneliness, and algia refers to pain or suffering.

In addition, the concept has been constructed such that it has a ghost reference or structural similarity to nostalgia so that a place reference is imbedded. Hence, literally, solastalgia is the pain or sickness caused by the loss or lack of solace and the sense of isolation connected to the present state of one's home and territory. (Albrecht, 2019, p. 45)

Albrecht (2019) discussed solastalgia as psychoterratic and somaterratic, emphasising emotional embodied experience. Albrecht (2019) also offered other characteristics of climate-related emotions. Ecoagnosy is characterised by an absence of ecological awareness with dire consequences for the environment and human wellbeing, viewed here as the antithesis of kaitiakitanga (guardianship). Terrafurie is anger directed towards environmental destruction as seen through protest. Symbiocene is an aspirational future epoch wherein humans live in harmony with the natural world, fostering ecological balance and reciprocal benefit, echoing Haraway's (2016) posthuman symbiosis, or as indicated earlier in this paper, Indigenous ways of being. Albrecht (2019) recognised that Western-focused approaches fall short in capturing the environmental emotions and connections expressed in Indigenous knowledge systems. In this paper, we offer an extension of the concept of solastalgia informed by Indigenous and care ethics perspectives to convey the lived experience and emotional depth of feelings interwoven into relationships with environments. A Māori perspective offers a lens that enriches the environmental narrative with depth and cultural specificity.

Care ethics intersects with Indigenous knowledge

Sheather et al. (2023) scoped the literature for ethical considerations in health related to environmental change and found a need for a multi-faceted principled approach, which Indigenous and feminist care ethics could provide (Whyte and Cuomo 2016). Social justice is a fundamental feminist concern, core to care ethics which calls for care for our world. Fisher and Tronto's definition of care is 'a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible'

(Fisher and Tronto 1990, 40). Care ethics theory has a conventionally limited focus on human relations (Randall 2019) and is embracing the extension of relations beyond humans (Flower and Hamington 2022). A central tenet of care ethics is that care is relational based on interdependencies, and past, present, and future generations benefit or suffer from the actions of other generations. Flower and Hamington (2022) see Tronto's caring with/solidarity as care-based relational thinking suitable to consider climate emergency. Future generations are in a perpetual state of dependency (Randall 2019), which calls for an intergenerational care ethics. Care ethics can learn from Indigenous knowledge as care, ethics and environmental concerns are central to an Indigenous ethic. Whyte and Cuomo (2016) provide a summary of Indigenous conceptualisations of care which value collectives, are relationally interdependent, explicitly draw on ancestral knowledge to restore and repair. Collective responsibility for guardianship for all beings and entities in the past, present and future is a shared significance. Seeing entities in relation and as active agents recognises how the environment supports life on earth, and a human responsibility is to ensure that these elements can fulfil their roles (McGregor 2004, 12). The next section of the paper draws on literature about emotional responses to the climate emergency and critically engages with the literature using Indigenous and care ethics perspectives.

Critical reading of the Solastalgia literature

This critical reading emerged from conversations about how climate emergency and distress relate to Indigenous and care ethics knowledge. We set out to understand how incorporating Indigenous knowledge and care ethics would enhance recognition of the emotional and relational impacts of climate change, especially for Indigenous communities. This is a topic that is emergent at pace and thought it important to offer this perspective to inform future research in this field. The literature review approach is aligned with a rapid review (Khangura et al. 2012) where the literature findings support a critical reading that reflects depth of understanding of the topic, in this case through Māori knowledge (Mātauranga) and ethics of care. The papers provide an opportunity to critically examine knowledge production through care ethics and Indigenous lenses and draw out methodological and theoretical concerns.

Search terms were developed with Māori liaison librarian Stephanie Clout:

Relational aspects OR emotional aspects

AND Solastalgia OR Ecological grief OR Climate anxiety

AND Climate emergenc AND Indigenous knowledge OR Indigenous practices

AND Ethic of care.

Quotation marks and parenthesis were added. The EBSCO Ovid, and PEP databases returned 40 articles using these keywords. Out of the 40 articles, seven were primary research (see [table 1](#) below). Additionally, two more articles were sourced through hand searching references, bringing the total to nine research articles for review.

Of the nine articles, six were quantitative studies that included validation of a solastalgia scale (Caceres et al. 2022), secondary data analysis in a coal mining area (Canu et al.

Table 1. Review articles.

	Location:	Focus	Method	<i>n</i>	Findings	Ethics of care analysis
Cáceres et al. (2022) – ‘What Is Solastalgia and How Is It Measured? SOS a Validated Scale in Population Exposed to Drought and Forest Fires’	Maule region, Chile	Measurement of solastalgia.	Development and validation of Scale of Solastalgia (SOS).	<i>n</i> = 223 (58 per cent women)	Dimensions of solastalgia identified; association with post-traumatic stress disorder.	Aids in creating tailored interventions and informing policy.
Canu et al. (2017) – ‘Mountaintop Removal Coal Mining and Emergent Cases of Psychological Disorder in Kentucky’	Kentucky, USA	Psychological impact of mountaintop removal coal mining.	Analysis of State Emergency Department Database.	<i>n</i> = 1,380,407	Increased risk for depressive and substance use disorders in areas with mining activity.	Identifies psychological impacts but needs more depth. And community engagement.
Eisenman et al. (2015) – ‘An Ecosystems and Vulnerable Populations Perspective on Solastalgia and Psychological Distress After a Wildfire’	Arizona, USA	Relationship between psychological distress and solastalgia post-Wallow Fire.	Household survey; Kessler Psychological Distress Scale.	<i>n</i> = 416 surveys completed, response rate 37.5 per cent.	Higher solastalgia scores associated with significant distress.	Lacking in cultural sensitivity and diversity; minimal community engagement
Helm et al. (2018) – ‘Differentiating Environmental Concern in the Context of Psychological Adaptation to Climate Change’	United States	Impact of different forms of environmental concern on ecological stress and coping.	Online survey of 342 U.S. adults.	<i>n</i> = 342 U.S. adults	Biospheric environmental concern linked to perceived ecological stress and coping.	Analysis of psychological responses to climate change; no specific focus on Indigenous perspectives or contexts
Higginbotham et al. (2006) – ‘Validation of an Environmental Distress Scale’	Upper Hunter Valley, Australia	Validation of Environmental Distress Scale (EDS).	Mail survey in mining area and farming area.	<i>n</i> = 203	Higher environmental distress scores in high disturbance mining area.	Addresses ethics of care by developing and rigorously validating a tool to measure environmental distress.
Kokunda et al. (2023) – ‘Batwa Indigenous Peoples forced eviction for “Conservation”	Uganda	Impacts of forced eviction on the Batwa community.	Semi-structured interviews, thematic analysis.	<i>n</i> = 19	Emotional and cultural distress due to eviction.	Strong ethical engagement, deep cultural sensitivity, effective responsiveness to community needs
Kumar, Kumar, and Sarthi (2021) – ‘Feeling solastalgia: A study of the effects of changing climate in rural India’	Rural India	Effects of climate change on emotional and psychological wellbeing.	In-depth interviews, thematic analysis.	<i>n</i> = 34	Emotional distress and disconnection from land due to climate change.	Culturally sensitive approach, ethical engagement, focus on emotional distress.

(Continued)

Table 1. Continued.

	Location:	Focus	Method	<i>n</i>	Findings	Ethics of care analysis
McNamara and Westoby (2011) – ‘Solastalgia and the gendered nature of climate change: an example from Erub Island Torres Strait’	Erub Island, Australia	Gendered nature of climate change.	Documenting experiences of ‘Aunties’ on Erub Island.	<i>n</i> = 4	Feelings of sadness, worry, fear, and distress related to environmental changes.	Attentiveness to emotion and environment, responsibility through community-involved projects. Responsiveness in addressing needs and contributing to the community future.
Phillips and Murphy (2021) – ‘Exploring Solastalgia in Southeast Ireland’	Southeast Ireland	Community experience of solastalgia due to coastal erosion.	Analysis of empirical measurements of solastalgia, place attachment, and place disruption.	<i>n</i> = 271	Solastalgia experienced by residents, correlated with place attachment.	Attentive to coastal community emotional impacts from environmental change. Shows responsibility in exploring solastalgia but a broader approach is needed.

2017) and survey (Eisenman et al. 2015; Helm et al. 2018; Higginbotham et al. 2006; Phillips and Murphy 2021). Three qualitative studies were interview based (Kokunda et al. 2023 Kumar, Kumar, and Sarthi 2021; McNamara and Westoby 2011;). The studies were in Arizona, Uganda, Ireland, India, and Torres Strait Australia. The research approaches were Western-centric paradigms of scientific inquiry, including the use of psychological scales, thematic analysis, and statistical models, which influence the interpretation of solastalgia.

Unsurprisingly, research happened in areas where environmental degradation resulting from extreme weather events had occurred. Caceres et al. (2022) work in a dry coastal land area in Chile advanced the study of solastalgia, building on the foundational work of Higginbotham et al. (2006), who developed the Environmental Distress Scale to assess biopsychosocial costs of ecosystem disturbance, centred on Australia's Upper Hunter Valley. The Environmental Distress Scale combined dimensions of hazard perception, threat appraisal, and perceived impact, aiming to discriminate between individuals exposed to varying levels of environmental disturbance. Caceres et al. (2022) extended this by developing the Scale of Solastalgia, which refined the dimensions of solace and algia through parallel factorial analysis and correlation with the SPRINT-E scale, a measure evaluating post-traumatic stress disorder symptoms related to disasters. This validation process confirmed the reliability and validity of the Scale of Solastalgia. Caceres et al. (2022) embraced a more comprehensive conceptualisation that emphasised integration, rather than isolation. Phillips and Murphy (2021) conducted a questionnaire survey in Courtown and Riverchapel in Wexford, Ireland to study impacts of coastal erosion. Their analysis revealed significant solastalgia among residents, characterised by feelings of sadness, worry, and disappointment due to the loss of the beach, with longer-term residents and those with stronger emotional ties to the area experiencing more intense solastalgia. Despite environmental disruptions, the community maintained place identity through emotional and symbolic connection to the area, though place dependence in terms of reliance on place had weakened. This study highlights the nuanced relationship between emotional responses to environmental change and psychological ties to the environment, illustrating the deep connection which holds people to place while witnessing its degradation.

Helm et al. (2018) differentiated types of environmental concern and how that linked to psychological adaptation to climate change in a survey study. They found that people with high climate change concern acknowledged ecological stress and engaged in ecological coping. People with high social-altruistic concern engaged in coping with less perceived stress related to climate change. People with high individualist concern were not stressed by climate change nor moved to community response. Climate change-related stress was significantly associated with a lower sense of hope for the future. Ecological coping through initiative-taking behaviours for climate action provided better hope for the future. They call for public policy and environmental campaigns to broaden their focus beyond climate change concerns to include strategies that provide opportunities for collective action to mitigate potential large-scale negative mental health effects.

Wildfire and drought also featured as impacts of climate degradation. Following wildfires in Arizona Eisenman et al. (2015) devised a bespoke scale to measure solastalgia in a household survey ($n = 1387$) undertaken using site visits and interviews. Factors associated with significant psychological distress included actively defending one's

home from the fire, questioning permanent residence, and consequential negative financial effects. Initiative-taking activities to defend one's home and a commitment to permanent residence were not significantly associated with psychological distress for residents. The researchers advocated for novel post-wildfire recovery interventions that include restoration of the physical environment, and recognition of the emotional connection to place. This could include community-driven replanting, landscape rituals, and other practices to rebuild a sense of relational and ecological continuity.

Two qualitative studies investigated the impacts of drought. Both studies found significant distress related to the changes experienced through extreme weather events, threats to life, and challenges to sustaining food production. Kokunda et al. (2023) used a co-produced approach to conduct nineteen semi-structured interviews with members of the Batwa community in Uganda to investigate the impacts of forced eviction following drought and environmental degradation. Kumar, Kumar, and Sarthi (2021) undertook an ethnographic study within rural Indian communities, with observations and in-depth interviews to examine the emotional and psychological consequences of climate change. Their approach aimed to elucidate the interplay between climate change and the cultural and spiritual wellbeing of the people.

Two studies captured data explicit to Indigenous community. McNamara and Westoby (2011) interviewed 'Aunties' on Erub Island to explore gender-specific effects of climate change. Focusing particularly on the emotional and psychosocial outcomes, they acknowledged the relationship between the land, sea, and the wellbeing of the people. Canu et al. (2017) examined the psychological effects of mountaintop removal mining by analysing large-scale data from emergency department use within a state in Kentucky. They applied logistic regression models to investigate the association with mental health diagnoses. The statistical representation in the study indicates that the Native American category accounts for less than 0.01 per cent of the total sample size of 1,380,394 individuals, which is significantly lower than the state-wide percentage of 0.3 for Native Americans so was unable to provide significant power to determine an outcome for this population. The research found a greater risk for depressive and substance use disorders in areas affected by environmental changes, associated with solastalgia.

Solastalgia research provided insights about how solastalgia is experienced, recognised, and operationalised and how methodologies create different knowledge production and opportunities for community involvement. Helm et al. (2018) identify how collective action can offer opportunities to mitigate solastalgia and make an important call for policy responses to promote this. The studies that identified high levels of demand and low levels of control such as forced displacement following floods, showed increased solastalgia. This raises a question about whether a collective responsibility for care for people and the planet is directed to the right communities at the right time.

Discussion – Solastalgia through indigenous knowledge and care ethics lenses.

Research informed by an ethic of care enables a systematic guide for research to set out or review who sets the priority for the research, who the topic is important to, how to conduct research in a way that is acceptable to the community it impacts, and what

change is sought (Brannelly and Barnes 2022). Interdependencies are valued. Research is context specific, and the real world is messy. A feminist concern for marginalisation calls for responsibility to create change. A Mātauranga Māori lens offers a deeper reading of how connections to land and place are conceptualised and what collective responses are valued. Indigenous knowledges emphasise a profound, spiritual connection to the environment, with biospheric degradation carrying deep cultural and communal implications. The loss of land is not just a physical displacement but a loss of culture, identity, a way of life and of the intricate guardianship practiced over generations. In contrast, solastalgia studies tend to focus on individual psychological impacts, with less emphasis on the cultural or spiritual aspects of the connection to the environment. These studies advocate for policy and community interventions that may be quite different to what Indigenous communities require to heal.

In their examination of mountaintop removal coal mining in Kentucky, Canu et al. (2017) lack attention to an Indigenous perspective, despite the historical ties to tribes such as the Cherokee, Shawnee, and Yuchi. Targeted inclusion would have altered the findings of this study to be useful for this community. Eisenman et al. (2015) examined the relationship between psychological distress and environmental change post-Wallow Fire in Arizona, but the research overlooked crucial engagement with the affected Indigenous community on the Fort Apache Indian Reservation. This oversight fails to capture the effective forest management strategies (United States Department of Agriculture, Forest Service, Southwestern Region 2011). Reservation management practices included communal action to clear young trees, forest management and logging, and prescribed burns, to significantly reduce fire severity. This context represents community activity in the protection and guardianship of the land to respect the actions that have prevented further destruction from occurring. By being attentive to community, future studies can better recognise and integrate traditional ecological knowledge and land stewardship practices of Indigenous communities, ensuring responsive to the lived experience of these communities.

Kokunda et al. (2023) ensure that the voices and experiences of Batwa people are present. In comparison, Kumar, Kumar, and Sarthi's (2021) ethnographic study in rural India demonstrates a commitment to understanding the emotional impacts on the community but lacks the depth of engagement found in Kokunda *et al.*'s work, thereby failing to fully embrace the responsibility and responsiveness aspects of care ethics. Kokunda et al. (2023) exemplify how engagement can lead to more respectful and meaningful research to capture the experience of Indigenous communities. McNamara and Westoby (2011) include Indigenous voices but could further enhance its alignment with care ethics by ensuring co-production of the research with the community, thereby embodying the principles of responsibility and solidarity. Tupou et al. (2023) critiqued McNamara and Westoby for not fully capturing the nuanced cultural dimensions of the Aunties' experiences, suggesting a need for interpretation based in cultural knowledge in deeper engagement and responsibility to honour the contribution.

While Helm et al. (2018) provided valuable insights reflecting an Anthropocene perspective on human-centric motivations, they overlooked integrative and interconnected worldviews of Indigenous communities, consistent with the Chthulucene (Haraway 2016), which emphasises biospheric deep interconnectedness of all life forms. Future research that extends beyond human-centric concerns to embrace a biospheric approach

acknowledging interconnections in the Earth's ecosystems more accurately reflects the experiences of Indigenous communities. This shift from an anthropocentric to a more holistic biospheric perspective is crucial for fully appreciating the multispecies entanglements and symbiotic relationships that are central to Indigenous worldviews. Integrating the Chthulucene perspective lends to an inclusive and interconnected approach in understanding and responding to environmental challenges, recognising the significant role of all forms of life in shaping our environment and our collective ecological narratives.

Solastalgia neglects the concept of embodiment. Addressing climate crisis requires an engagement with the relationship between health and climate to not overlook the intricate interdependencies that define existence and the ethical and psychological implications of actions (Sheather et al. 2023). The focus on the individual's psychological and emotional responses to environmental degradation, confines embodiment to the physical body alone which constrains a more expansive understanding of interdependent existence interwoven with the world. Identities and lived experiences have intricate links to the other-than-human world around us (Flower and Hamington 2022), as part of the ecosystem which shapes wellbeing, personifying interconnectedness that defines our existence.

By acknowledging that our sense of self extends beyond our individual bodies and encompasses the wider world, we can develop a richer understanding of how climate change impacts not only the physical environment but also our emotional and psychological landscapes. Whyte and Cuomo (2016) emphasise that care ethics can provide a compelling foundation for understanding the interdependencies that shape our relationships with both human and non-human entities. They argue that our ethical considerations extend to the bodies we care for, particularly those that historically face marginalisation – such as women's bodies and the bodies of Indigenous peoples. These are the very bodies that venture into the world, engaging with the environment in ways that reflect interdependence and relational responsibility. Embracing a broader understanding of embodiment that includes connections to the environment, and to past and future generations creates an ethic of relational responsibility. Randall's (2019) 'imaginal' relations with future generations align with Indigenous perspectives, where embodiment moves both forwards and backwards in time, recognising that internal and external spaces are integral to one another. The interdependence of these relationships underscores that our actions today are not only for our own well-being but also for the benefit or suffering of those who will inherit the world. This emphasises ethical responsibilities arising from these interconnected relationships. By fostering a dialogue that embraces these complexities of solastalgia, we can invite contributions from diverse Indigenous perspectives and enrich the ethical frameworks that inform our responses to environmental distress.

An expansive, interdependent idea of embodiment that infuses Indigenous knowledge and values offers a culturally grounded, holistic perspective. This expansion, rooted in the interconnectedness and relationality inherent to Indigenous cultures, enhances care ethics as a way of thinking for addressing the complex emotional and environmental challenges faced by Māori and Pacific communities. McGregor (2004) calls for authentic and meaningful integration of Indigenous voices in academic discourse. This approach necessitates not only including Indigenous perspectives but prioritising Indigenous

scholars and knowledge keepers to lead and shape these discourses. By doing so, solastalgia is meaningfully conceptualised, understood and researched, ensuring that Indigenous knowledge is foundational to academic exploration.

Strengthening indigenous voices

Solastalgia needs to accommodate cultural knowledge while responding to climate degradation emerging at an unprecedented pace and scale. Tupou et al. (2023) identified the potential for unwitting recolonisation through repetition of previous harmful experiences through research practices (Smith 1999 [2012]). Tupou et al. (2023) note that solastalgia is applicable and acceptable primarily within settler communities and suggest that in Pacific contexts, a refined approach or different conceptual framework might better acknowledge Pacific peoples' unique relationship with the land. They underscore the urgency for research that honours the profound, ancestral land connections and mental health implications for Pacific peoples; urging a more inclusive approach that weaves local and historical narratives into the understanding of environmental distress.

Indigenous ways of knowing offer insights into a place that encompasses the whole integrated psyche and cosmos. In this view, bodies and the earth form an interconnected celestial sphere. Such perspectives deepen understanding of solastalgia, like the wharenuī (communal space at Marae) includes a window that serves as entry and exit for the dead only, the Indigenous psyche, both collective and individual, is bound via tikanga tuku iho (thread) to the land and its experience of climate degradation. Napan, Connor, and Toki (2020) compellingly advocate for Indigenous-led pedagogies in research. The marae-based (Māori community setting) programme provides a knowledge space in the 'belly of an ancestor', a direct encounter with the land and its ancestral legacy. The academic co-creative inquiry approach engages Māori traditions and practices to foster deep, transformative learning experiences. Marae-based learning weaves in the principle of 'ako' – a Māori pedagogical approach that nurtures reciprocal and mutual shared learning and teaching or knowledge production in a shared space that invites open-ended, inclusive discussion (Napan, Connor, and Toki 2020). The approach engenders a collaborative knowledge journey in interaction with Māori-centred methods (Napan, Connor, and Toki 2020) to invite new understandings of solastalgia by enabling participants to develop collective wisdom. Tupou et al. (2023) found that this approach facilitates a re-evaluation of solastalgia to encompass the Indigenous notion of 'place identity', acknowledging the identity of Indigenous peoples and the collective, intergenerational trauma of environmental degradation.

In *Climate Justice: a Pacific Island perspective*, Enari and Viliamu Jameson (2021) emphasise the importance of Indigenous knowledge and cultural practices in developing effective solutions. Traditional cultural practices such as waiata (songs), haka (dance), whaikōrero (oratory), and talanoa (dialogue), are central to the expression of Pacific Islanders (Enari and Viliamu Jameson 2021). These concepts echo a Whakaaro Based Philosophy (Mika and Southey 2018; Simon 2021, 2023) which advocates for the use of storytelling and visual arts as potent research tools, enabling a deeper exploration of the emotional and cultural impacts of environmental change. Hemopereki Simon's Whakaaro draws extensively on Māori realities and myths to provide a critical cultural context for interpretations of environmental and psychological responses (Mikaere 2011). Simon

(2023) offers a valuable lens to interpret Albrecht's psychoterratic and somaterratic emotions. Waiata (songs) and haka (ceremonial dance) demonstrate the interconnection tāngata whenua (Māori) have with the whenua (land) (Simon 2023). These cultural expressions facilitate an understanding of the profound depth, akin to Albrecht's terratic emotions, which arise from adverse alterations to the environment. Māori culture conveys complex nuances of awareness linked to the terratic bond and disturbances. Simon's exploration reveals that an understanding of the emotional ramifications of environmental change is inherent within Indigenous culture. The wero (challenge) then, is for non-Indigenous systems to make space for the rich embodied knowledge Indigenous cultures to gain a more holistic understanding of the emotions tied to the environment, thus bringing the psychoterratic into sharper focus.

An example of relationship between people and land is how place features in colonial atrocities. The waiata tangi (funeral song) *E Pā Tō Hau* by Rangiamoa (Ngāti Apakura) is a response to the atrocities committed by British soldiers at Rangiaowhia in Waikato which depicts colonisation as elimination, grief, and dispossession (Simon 2023). Deeply rooted in the land, it creates a vibrational space of sanctuary for the women of Rangiaowhia who were raped, and children who were slain, the severity of which are encapsulated in the term *pāhautanga* (atrocity) in Waikato-Tainui oral history (Simon 2023). It expresses solastalgia as it is a vessel of shared experience, holding collective trauma and yearning following the genocidal seizure of their whenua (land, placenta), both being sights of invasion. Simon (2023) notes the atrocities despite their non-combatant status and the willingness to surrender. These brutal acts of *kōhuru* (murder), feature in the song to honour and vocalise the pain and the strength of the Ngāti Apakura people in the face of such overwhelming violation and loss (Simon 2023). Through its verses, it chronicles the tenacity of the Ngāti Apakura women, who withstood profound adversities yet preserved their spirit and heritage. The waiata becomes a linguistic conduit for expressing solastalgia, encapsulating the profound sense of loss and longing for a place altered by invasion (Simon 2023). The waiata locates solastalgia as intrinsic to place as both bodies and geographical location, a wounded landscape that holds shared memories and identities.

In the waiata tangi (funeral song) *'E Pā Tō Hau'*. Simon (2023) discusses the line *'E pā tō hau he wini raro,'* as expressing a felt sense of the whenua and the stories held within it. Here, the term *'hau'* – representing a cosmic power – reveals the Māori belief in the sacred bond between the physical and the spiritual, a bond that the waiata (song) vocalises, offering solace and understanding. In this context, solastalgia is not just an individual's distress over environmental change but a collective experience of loss and disconnection. Māori whakataukī (proverb) such as *ko te ūkaipō, te whenua; ko te whenua, te ūkaipō/my breastmilk is the land; the land is my breastmilk* further illuminates this connection, emphasising that the land nourishes us as the placenta nourishes the unborn child (Simon 2023). Similarly, *Te toto o te tangata, he kai; te oranga o te tangata, he whenua/while food provides the blood in our veins, our health is drawn from the land* underscores the intrinsic value of the land to our wellbeing. Simon's (2023) work invites us to rethink our understanding of solastalgia, it advocates for replacing *settler* colonialism with *invader* colonialism to more accurately describe the forcible dispossession and cultural erasure faced by Indigenous peoples (Simon 2023). This redefinition highlights the experience of solastalgia as continued experience of colonialism, or an *invader* emotion, an acute form of distress over the loss of land and culture. Simon's (2023) insights help to distinguish an Indigenously

minded elicitation of solastalgia, stressing the need for healing and culturally sensitive approaches that recognise the deep impacts of colonisation on the Indigenous identity, the wairua (animating substance or spirit) tethered to the environment. These stories hold the knowledge needed to inform how to repair the world for future generations.

Conclusion – renewing solastalgia research

There is a disconnect between the conceptualisation of solastalgia and its operationalisation in research, and the lived realities of climate-related distress as experienced by marginalised and Indigenous communities. Community-centred research carries the depth of lived experience knowledge, and explores what is important to the community to lead to fitting change. Research that understand Indigenous worldviews is deeply attuned to the long, layered histories of environmental degradation. Such an approach necessitates the development and application of research frameworks led by or co-produced with Indigenous scholars and communities, ensuring that the methodologies and interpretations of findings are reflective of, and responsive to, the complex and nuanced relationships communities have with their environment. Setting an expectation of participation for how solastalgia studies are conceptualised and conducted in culturally rich and diverse settings, ensures that communities contribute meaningfully in the face of ongoing climate challenges to create ethical research that meets the needs of those most affected.

Solastalgia research that embraces Indigenous methodologies and worldviews calls for a profound transformation in how we understand and engage with the land and its people so that lived experiences and knowledge of Indigenous communities are foundational to research. In translating these insights into practical actions, the interconnectedness of the self and the land in Indigenous thought is recognised. This perspective compels us to rethink our relationship with nature as our world and everything in it, an interspecies life support system dependent on care. To respond to the climate emergency as the priority health concern of our times, care for the land is central to our wellbeing. The benefits we derive from nature are not just physical but deeply emotional and spiritual. In embracing this wisdom, we can begin to develop policies and practices that are not only sustainable but also nurturing, both for the environment and for ourselves. This paper advocates for continued exploration and application of Indigenous methodologies in Solastalgia research. It calls for an ethic of care that is attentive, responsible, competent, and responsive, woven seamlessly into our knowledge, social, and policy frameworks in solidarity with Indigenous peoples. By doing so, we can hope to not only address the challenges of solastalgia but also foster a world where the land and its people are in harmony.

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