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Regenerative agriculture and a more-than-human ethic of care: a relational approach to understanding transformation

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Abstract
A growing body of literature argues that achieving radical change in the agri-food system requires a radical renegotiation of our relationship with the environment alongside a change in our thinking and approach to transformational food politics. This paper argues that relational approaches such as a more-than-human ethic of care (MTH EoC) can offer a different and constructive perspective to analyse agri-food system transformation because it emphasises social structures and relationships as the basis of environmental change. A MTH EoC has not yet been applied to regenerative agriculture, yet other literature on regenerative agriculture suggests that care may be present in these spaces and calls for the need for social science analysis of the regenerative movement. This paper uses a MTH EoC lens to reveal a diverse array of ways in which power is and can be deployed for change in the regenerative agriculture movement in Aotearoa, New Zealand. Globally, regenerative agriculture tends to be analysed through positivist, scientific approaches that focus on biophysical markers of ecological improvement. Yet, a relational approach reveals how engagement in regenerative agriculture is creating significant shifts in mindset towards more holistic and relational understandings of biological and social ecosystems. A regenerative mindset framework is suggested as a method of understanding the connection between a regenerative form of thinking, being and doing for farmers. Interviews suggested that this shift in farmers' socio-ecological relations is crucial to the transformational potential of regenerative agriculture. This paper argues that relational analyses such as the MTH EoC approach used to analyse regenerative agriculture in this research, refresh the way we analyse agri-food system change. They also are critical to guiding and supporting on-the-ground socio-ecological shifts that are necessary to see agricultural transformation.

Keywords Regenerative agriculture · Ethic of care · New Zealand · Transformation · More-than-human

Introduction

It is well-known that global systems of food production are environmentally polluting and socially destructive (Willett et al. 2019). As such, academic debate has focused on the nature of food system change and how to understand and create more positive and sustainable outcomes. But the complexity of food systems and their power structures means achieving systemic change is difficult. Global environmental change and societal responses require systemic change that will either be forced, unplanned and detrimental, for example, because of climate change, or, they will occur through deliberate efforts for profound transformation of provision and consumption systems to mitigate significant impacts of these changes (Brown 2014; Folke et al. 2010) argue that the resilience of social-ecological systems (SES), requires transformation to involve not just changes to the variables that make up SES, but also ways of thinking, values, perceptions, meaning and ways of interacting, including associated institutional and political arrangements and power relations. In the context of food system change, the need for food system transformation is "irrefutable" and will require "major shifts in mindsets" to address the impacts that food systems have on agriculture, value chains, health and planetary ecosystems (Webb et al. 2020, p. 584). In this context, incremental changes to discrete components within agri-food systems are not sufficient, and more radical and holistic change is required. Efforts at food system

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transformation are complex and multifaceted, which result in diverse entry points for analysis of their potential for long term, systemic change. Thus, how we understand the theory and practice of achieving systemic change in the food system is a heavily contested question (McClintock 2014; Moragues-Faus and Marsden 2017).

In New Zealand, the challenge of food system change is also urgent. Despite the country's "clean and green" marketing reputation, the social and environmental cost of the primary industry sector has become more evident in recent years. Water over allocation and pollution, methane emissions from livestock, biodiversity loss, poor farmer mental health and wellbeing, and a degraded social license to farm are some of the major issues now at the centre of New Zealand's debates about the future of farming (for example, Morgaine et al. 2017; New Zealand Productivity Commission, 2018; MfE and Stats NZ, 2019; One News, 2019). As a country that relies on agricultural exports, the need to create sustainable pathways for food production is of critical economic value, on top of already essential socio-ecological concerns.

Rising pressure to move away from unsustainable levels (and practices) of production has meant that the controversial and somewhat ambiguous term 'regenerative agriculture' has become a buzzword in New Zealand agriculture over the past few years. The term 'regenerative organic' was first coined in the 1980's by Robert Rodale as a holistic approach to farming that included social and economic improvements alongside environmental benefits (Rodale Institute 2019). Since then, the term has evolved beyond organic to broadly include land management approaches that aim to build soil health, crop resilience and nutrient density by aligning with natural processes such as the carbon and hydrological cycles (The Carbon Underground 2017; Masters 2019). Practices such as minimizing soil disturbance, keeping the soil covered, integrating livestock, creating crop diversity and maintaining living roots in the soil year-round are seen as a pathway for restoring the chemistry of dirt to the biology of soil (Brown 2018). Soils are weaned off heavy use of fertilisers and increased biodiversity is substituted for pesticides to keep plants healthy (LaCanne and Lundgren 2018). As such, farm inputs decrease, reducing costs for farmers (Brown 2018; LaCanne and Lundgren 2018). Concepts such as organic agriculture, agroecology, permaculture, and biodynamics can all fall under the wider umbrella of regenerative agriculture (Grelet and Lang 2021). A key feature however is that regenerative practices are context specific, and therefore no two farms will practice or embody it in the same way. This poses particular challenges in defining regenerative agriculture and as a result, definitions sometimes include higher-level principles rather than practices alone[1].

Regenerative agriculture has been developed in grassroots, predominantly farmer-led spaces, over the past several decades as a systems design approach to agriculture that is a step beyond sustainability. Rather than focusing on reducing harm, agriculture is seen as an opportunity to actively improve the health of ecosystems (Siegfried 2020). It is this feature of regenerative agriculture which drives Rhodes (2017) to label it as imperative to address impacts related to agricultural practices. In New Zealand, industry players such as farming cooperatives, government ministries, research institutes and product marketing groups, are beginning to consider (and debate) the potential regenerative agriculture has to transform the country's agri-food industry. Internationally, large multinational corporations have similarly begun to make commitments to sourcing regeneratively grown products indicating a strong popularization and commercialization of the term (General Mills 2021; Nestlé 2021; PepsiCo 2021). However, the paradigm we use to analyse regenerative agriculture is critical for understanding the transformative potential it holds. Globally, regenerative agriculture is often analysed through positivist, scientific approaches that focus on biophysical markers of ecological improvement. Understanding processes of agricultural change needs to go beyond the measurement of discrete variables, practices and outcomes. Our argument is that a more-than-human ethic of care (MTH EoC) analysis of regenerative agriculture focuses attention on relationships and values of care that are overlooked in purely science-based analysis of changing agricultural practices. A MTH EoC offers a different, and constructive perspective for understanding processes of agri-food system change. We build on calls within the literature to expand approaches used to understand agri-food system transformation (Tregear 2011; Lamine et al. 2019) and explore the potential of socio-ethical concepts such as justice and care (Gottschlich and Bellina 2017) in the context of regenerative agriculture. We argue that a MTH EoC lens reveals a diverse array of the ways power is and can be deployed for change in the New Zealand regenerative movement. This is because a relational approach aims to understand transformation in a way that emphasises social structures and relationships as the basis of environmental change.

The following section provides an overview of the theoretical context of this argument by exploring the features of a MTH EoC lens that were used to analyse regenerative agriculture in this research. The article then moves on to the case study research of regenerative agriculture in New

[1] For example, see similar but varying principles laid out by each Soloviev and Landua (2016), Jellie (2020) as well as Grelet and Lang (2021) for a New Zealand overview of the concept.

Zealand. The methods of the research are covered, followed by presentation and discussion of some of the results that were revealed through a MTH EoC lens. The final section concludes with the potential of MTH EoC lens to refresh the way we analyse transformation and practice on-the-ground agri-food system change.

Relational politics: a more-than-human ethic of care

The use of MTH EoC as a relational lens for analysis of transformation is based in two areas of literature: more than humanism, and geographies of care. A MTH EoC approach connects care ethics and the natural world by using a relational understanding of the world that draws directly on connections between humans and all bodies around us. This relational approach creates a useful lens for revealing and understanding socio-environmental change and therefore, a more-than-human ethic is an ethic of care that has particular relevance for regenerative agriculture.

Geographies of care have similarly been developed though the relational approaches of feminist geographies in recent decades. Defining a care ethic, Fisher and Tronto (1990, p.40) write that it is.

> *…everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web.*

An ethic of care lens places value on relationships, including those that are intimate or personal. There are strong arguments for the connections between practices of care and processes of change. For example, Conradi (2015) conceptualises care as being underpinned by the practice of attentiveness. It is attentiveness that makes activities of care feel genuine, unbounded by expectations of reciprocity, yet embedded in the relation *between* two people. Social interactions that are founded on this care practice generate attentive interactions and in doing so create the possibility for societal transformation through noticing the need for care and acting accordingly (Conradi 2015, p. 125). Similarly, Krzywoszynska (2019) builds on this conceptualisation with the theory of care networks. Individuals are considered to be surrounded by interdependent relationships with all living entities and recognising these connections demand that care-givers attend to these networks. Being attentive to the entities of a care network is a process of experiential and intellectual development, but one that can allow societal transformation to become visible through individual and collective learning (Krzywoszynska 2019).

Care has traditionally been viewed as a human-centered process of relationality where analysis has focused on care-based practices such as care-work (McEwan and Goodman 2010). However, care can be enacted through co-produced socio-ecological relations in a way that begins to diverge from such static humanism. Beacham (2018, p 539), argues that an "ethic of care framework serves to problematize hierarchical normative ethical frameworks - which place the human at the top or centre - and instead proceeds with a vision of a horizontal web of interdependency between all matters". Applying an ethos of care requires rethinking the order and structure in our world to reveal power imbalances but also spaces of possibility. This rethinking extends beyond the thoughts of humanism and social constructivism which are situated in the human world to include more-than-human entities into care networks. This therefore includes those entities not sense-able to humans but which are regardless present, in such networks (Krzywoszynska 2019).

Thus, the more-than-human approach provides further depth to an ethic of care to aid understanding of nature-based systems such as agriculture. The binaries of human/nature that have dominated socio-ecological relationships through western (and often colonial) discourse have legitimised the large-scale exploitation of people and the planet (Orr 2002; Alkon 2013; Parsons et al. 2017). To adequately address linked social and environmental challenges, removing this perceived separation is essential (Alkon 2013; Moragues-Faus and Marsden 2017; West et al. 2020). It is important to acknowledge here that the creation of such dualisms between nature and culture are not universal and as such, neither is the act of deconstructing binaries. Many indigenous cultures have never formed such divisional constructs (Whyte and Cuomo 2016; Hikuroa 2017; Winter 2019). Although the term 'regenerative agriculture' originated in the United States in the 1980's (Rodale Institute 2019), indigenous cultures often have embodied care-full socio-ecological approaches to agriculture for centuries (Sundberg 2014). In the New Zealand context, indigenous-led approaches to addressing socio-ecological systems change often focus attention on how knowledge and practice are shaped by relations between human and non-human actors (Parsons et al. 2017). However, the dominance of western ontologies means that a far more exploitative conceptualisation of socio-ecological relations has been ingrained into dominant development discourse and into agriculture. Using a relational ontology such as more-than-humanism for environmental challenges unsettles these views, reinforces humans and environment as co-constituting and co-produced (Booth 2013) and therefore highlights these relationships as critical components of transformative change.

A MTH EoC recognises that care that accommodates humans and non-humans is essential for the survival of both communities (or the combined singular) in current global socio/environmental crises (Beacham 2018). Thus, a MTH EoC is an ethic of care that is well suited to analysing regenerative agriculture - a movement which claims to address such crises within agriculture. Gibson-Graham and Roelvink (2010, p. 334) argue that "the needs of animals, plants, soils and water sources, for example, have become a matter of concern that is reorganizing the food production industry". Therefore, applying a MTH EoC to regenerative agriculture provides insight into how care has not been met sufficiently in the past within the agricultural industry. There is some notable work that exists in this space already such as that done by Puig de la Bellacasa (2010; 2015; 2017) that focuses on more-than-human care and soil relations. While a MTH EoC has not yet been applied to regenerative agriculture, other literature on regenerative agriculture suggests that care may be present in these spaces (Gosnell et al. 2019) and which calls for the need for social science analysis of the regenerative movement in New Zealand (Burns 2020).

We argue that a MTH EoC provides beneficial and constructive ways for re-conceptualizing our understanding of transformational agri-food politics and has particular relevance for understanding the regenerative agriculture movement. Looking at care, with care, highlights aspects of system change that have previously been hidden in other forms of analysis. These areas of research focus our attention on the multiplicity of relationships in a more-than-human world, a contrast to the predominantly scientific reductive or technocratic perspectives that have been used to examine regenerative agriculture with the aim of validating the outcomes of on-farm practices. Therefore, using a MTH EoC lens to understand New Zealand's regenerative agriculture offers space to question paradigms that have traditionally shaped western agriculture and provide fresh insights for understanding agri-food system change.

Methods

Twenty-one semi-structured interviews were conducted with people involved in the New Zealand regenerative agriculture for this research: twelve farmer interviews, four farm advisors, four researchers, and one community group representative. Attendance to a two-day Organic Dairy and Pastoral Group conference in March 2020 allowed for initial scoping of the regenerative movement in New Zealand and identified key actors within the space. Participants were then recruited using a snowball sampling method where contacts from this conference were then used to recruit others (Valentine 2005). In addition to this, farmers were contacted through regenerative agriculture social media groups. Selective sampling was also used to seek participants from relevant organisations for the non-farmer participants. All interviews were conducted between May and September 2020.

The farmers were from the regions of Otago, Canterbury and Southland. The criteria for farmers to participate in the study was that they must be currently using 'regenerative practices' on their farm for two years or more. Since 'regenerative agriculture' is not clearly defined, participants self-defined their regenerative practices based on a range of ecological practices such as an emphasis on biodiversity, a focus on building healthy soils, and a reduction or elimination of chemical fertilisers and pesticides/herbicides, and an emphasis on replicating natural cycles or farming 'with nature' (The Carbon Underground 2017; Rodale Institute 2019). The study included farmers who practiced horticulture (1), dairy (1), and sheep/beef farming (10). This ratio of farming types was due to the nature of the participants who indicated interest in this study which is likely due to regenerative agriculture currently being more established in pastoral farming in New Zealand. Farming organically was not seen as a prerequisite for regenerative agriculture and therefore 11 out of 12 farmers were not full organic practitioners. All the farms were commercial operations that varied in size from a few hundred hectares to several thousand. This was a specific design choice of the study due to the pivotal role commercial farms play in national and international food systems. Ten of the interviews were in-person farm visits, the rest were online Zoom interviews due to location and availability of participants. The in-person farm visits also involved a short farm tour (where time permitted) to allow the farmer to share aspects of their farm with the researcher. The farmer interviews were primarily one-on-one interviews with male participants, but sometimes included spouses.

Interviews were semi-structured and conversational but guided around core thematic questions that asked farmers about their relationships, values, their on and off-farm decision-making and how these had changed over time. For non-farmer participants, these interview themes were similar, but in some cases extended to wider discussions about the industry and their perceptions of how the regenerative movement in New Zealand was developing. Interviews were transcribed and analysed through inductive coding to allow for a more exploratory approach to the interviews, to identify emergent themes across interviews and to build a deeper understanding of processes and connections (Cope 2016). These methods of analysis resulted in an emergent analytical framework that provided insight into the themes of more-than-human relationships, decision-making,

identity, and wellbeing that were all embedded in processes of shifting to regenerative agriculture.

Results and discussion

We used a MTH EoC lens to understand the way in which regenerative agriculture creates space for shifting towards care-based socio-ecological relations. Interviews suggested that a shift in mindset was related to *being regenerative*: a state of being that involved reforming their socio-ecological relations rather than performing the technical practices of regenerative agriculture alone. This mindset is what people use to form and re-form their connections to the world around them (regenerative relationships), make decisions (regenerative decision-making), and therefore begin to influence the industry within which their livelihood work exists. The mindset has implications for sense of self, identity and perceptions of how they fit into larger group dynamics that are shaped by wider agri-food discourses and rural identities.

The following results and discussion sections will cover three key points that emerged from this research and the implication of understanding regenerative agriculture as a pathway to being regenerative. The first two sections explore in more detail how a MTH EoC lens reveals the components of being regenerative that can exist in a farmer's everyday experience of regenerative agriculture. Themes that emerged from the interviews were categorised into ways of engaging with relationships and decision-making. A MTH EoC lens allows the linkages between thinking, being and doing to be identified and analysed.

This discussion section then goes on to propose how these components of regenerative relationships and decision-making are strongly interlinked and co-produced. A process-based framework is proposed here to represent this interconnection. The cumulative effect of these components is explored, particularly with regard to how being regenerative has implications for participant's identity and wellbeing. Lastly, the wider implications of taking a relational understanding of regenerative agriculture are discussed. This section considers how a relational understanding shifts the way we might approach transformation in New Zealand agriculture by considering the ways that the power dynamics of a mindset shift may contribute to the adoption of new paradigms in the wider industry.

Applying a MTH EoC lens: regenerative relationships

Thematic coding of the interviews reveals that there were certain components of relationships and decision making that participants frequently referred to as important in their daily lives. These relationship and decision-making features were found to embody a MTH EoC. Of particular interest are the conscious decisions by participants to reject negative relationships and create new ones that embody mutuality, reciprocity, trust and interdependency with their human and non-human environments which conceptually are key features of an ethic of care. Regenerative relationships were categorised to have four major features. These are attentiveness, an understanding of the power dynamics of interrelation, conceding control to regain balance, and a shift in valuing of non-human species.

Attentiveness

As participants became more engaged with regenerative agriculture, they increasingly became more aware and observant of their surrounding environment, often including more-than-human bodies into their network of awareness and care. But also, vice versa, participants entered regenerative networks as a pathway for action after becoming aware of or observing environmental or social degradation. Farmers described points of difference between regenerative and conventional farming where they were actively "taking time out to actually go and just observe and be amongst the cows and see how everyone is…" (Farmer 15) or to be more attentive to soil life:

> *If you get down on your hands and knees and actually just sit there and look for five minutes, it's amazing what you'll see move. You know you never notice that walking across the paddock or driving a tractor across a paddock or spraying a paddock. – Farmer 12*

As seen here, attentiveness and observation were referred to in the context of directly using human senses such as sight, smell and sound to interpret farm environments, particularly, how they change over time. At first, this may seem an obvious action, but for these farmers, this observation was strongly linked to a conscious action of *being present* in their surroundings. Participants at the beginning stages of their transition to regenerative processes (both mental and physical practices), or those who work closely with farmers undertaking this process (e.g., consultants or advisors) were able to recall the important role of attentiveness and becoming "more ecologically aware" (Farmer 13) in this transition.

Power dynamics of interrelation

As farmers learn more about the world around them, their mindset continues to evolve and vice versa, their evolving mindset provides a new lens through which they see, learn

and (re)form relationships with their more-than-human environment. Acknowledging the power dynamics of this interrelation with the more-than-human is a critical part of forming regenerative relationships. Farmers spoke to the realisation of the interconnection between bodies in these networks and the power that runs through these structures. A sense of insignificance and humility in place becomes visible.

> *I think you become a lot more humble doing this because you realise that, fluff, I'm not as sharp as what I thought I was and you just realise how much you do not know. – Farmer 4*

While this understanding of the world as a "complex, life-sustaining web" (Fisher and Tronto 1990, p. 40) of relations created a humbling, and occasionally uneasy, sense of place for farmers, at the same time, a newfound consciousness emerged around the power of human action to influence these delicate assemblages. The ability of on-farm actions to disrupt such complexity accidentally or purposefully was a common realisation. With this reframing, we see a second, paradoxical sense of place forming. Human action is framed as powerful and therefore becomes the area and focus requiring management, rather than the natural environment:

> *I probably saw myself like most people do, as outside of the environment. You can buy 100 acres and you can be the boss…but you're really only fooling yourself. Now you realise that you're at the mercy of things, but you also realise just how much what you do next can change the outcomes. – Farmer 15*

It is through these two somewhat contradictory realisations which come with the regenerative mindset that the *social* part of socio-natures is engaged. To an extent, the agency of humans is thrown into turmoil as they are perceived as both actors and actants, both in control and out of it. This conceptualisation acts to hybridise the contrasting power dynamics of everyday more-than-human agricultural relations. The relationships humans have with non-human agents are embedded in unequal power, where humans are not always the most powerful.

> *You shift as your farm shifts. People shift. And remember, people are part of this ecosystem. So, we shift as our farm shifts. – Farm Advisor 1*
> *My view is that your land is… not necessarily, well maybe it is a reflection of you. – Farmer 11*

This framing reinforces the idea of reciprocity and interdependence of all life and all agents on all others. Relationships are hybridised; smashed together, and/or artfully carved into to form a variety of power dynamics that acknowledges that people and the environment are always co-constituting and have internal bearing upon each other (Booth 2013).

Conceding control to regain balance

In all the complexity and fluidity of natural systems, farmers recognised that their need to manage nature reflected the common human response to be in control. The mindset of domination over nature is rooted in colonial and westernised conceptions of nature that have historically shaped New Zealand's agricultural systems (Holland et al. 2002; Campbell 2020). Participants recognized the need to reform this mindset by embracing chaos and diversity.

> *In New Zealand specifically, there's a culture like this kind of tidy culture, that a landscape should be tidy. But in nature, there's nothing tidy… When you walk into a forest, it's chaos and diversity… that diversity is what drives the productivity of that ecosystem. So that's the big change in the way we look at the landscape, and also how we look at our farms that people need to achieve. – Farm Advisor 1*
> *So, I think getting your head around the fact that you don't need to kill everything all the time. Modern agriculture is, if you've got wheat, there can only be wheat in that paddock. You can't have a weed. You can't have an aphid …There's no living life, other than wheat in that paddock. – Farmer 12*

To practice a regenerative mindset, farmers noted the conscious choice to relinquish parts of this control and to instead trust in the complexity of natural systems to restore balance or teach them how to assist in creating that balance.

> *Rather than seeing something... say it's a weed, so we need to kill everything and so we nuke it with some chemical. But maybe we need to think, why is that growing? Is it bringing up a nutrient that's going to benefit things? – Farmer 5*

While this sentiment was not universal, it was explored by the majority of participants and was often connected to and supported by the value they began to place on non-human species.

Valuing non-human species

By recognising interrelation and conceding control, farmer's approaches to natural systems and more-than-human bodies changed. Other species were "becoming relevant

again" (Farmer 4) because they were seen to be an interdependent part of ecosystem function. Species previously seen as unproductive in farming systems became windows through which to see and learn about how the ecosystem is functioning on a level that is usually invisible to humans, such as soil microbiology and weeds:

> *Farmer 16: So, a lot of it's about looking after the plants. I think everyone on the farm loves the animals, loves the little baby animals especially. But they don't love their grasses and they don't love their weeds.*
>
> *Interviewer: but you do?*
>
> *Farmer 16: Yeah. Well, you realise what the weeds are actually doing… Now I'm realizing that all of these things that the stock don't eat are actually just as valuable as the things they do eat.*

Agricultural production no longer becomes the sole purpose of that system's existence. Boundaries of what is considered productive and unproductive are blurred. Extractive mentalities begin to be set aside, and worlds are seen to be organised *with* humans rather than *for* humans (Harrison and Anderson 2010). This framing of socio-ecological relations therefore demands not only respect but care for the rest of that environment as a more-than-human habitat.

The four components of attentiveness, power dynamics, conceding control and valuing non-human species all interact to create regenerative relationships. However, it is important to note that engaging with regenerative relationships is a conscious choice and is not universal to people who practice regenerative agriculture practices. However, when farmers do decide to engage with this relational way of being we can see how the transformative potential of an ethic of care begins to translate into their decision-making practices. This is how the relationship between ways of knowing and being, and ways of doing in regenerative agriculture are revealed. It is a pattern that farm advisors, likely due to their position in regenerative circles, can observe across the farmers they interact with:

> *What I tell regenerative farmers or people who are thinking about doing it, once you decide to become a regenerative farmer, once you feel in your heart that it makes sense, and your mind says, I can do this, that is the moment that you start regenerating your farm. It's not about what you start doing. It's the moment your mind goes there. – Farm Advisor 1*

These regenerative relationships developed by individuals on-farm do have limitations to which they are able to disrupt long-standing identities and practices associated with being a "good" farmer (Burton et al. 2020). However, these individual on-farm shifts in mindsets can collectively have an impact on the way the agricultural sector recognizes and responds to the emergence of regenerative agriculture.

Applying a MTH EoC lens: regenerative decision-making

Regenerative relationships often flowed on to impact decision-making on the farm and vice versa, decision-making often led to more evolved regenerative relationships. Regenerative decision-making can be understood as when an ethic of care lens is used to influence ways of knowing and being which translates into ways of doing for regenerative actors. There were four main features that emerged around the theme of regenerative decision-making. These were: a holistic approach, the learning process, timescales, and responsibility.

Holistic approach

One of the strongest themes to emerge from the research regarding the mindset of being regenerative was that of the holistic approach. Holism was found to be something that was referenced by all participants (directly or indirectly) in a way that guided their worldview and their on and off-farm decision making. A phrase that was frequently repeated by multiple participants was: "healthy soils, healthy plants, healthy animals, healthy people". This is a verbal recognition of the flow on effects and interconnections of various aspects of the more-than-human environment. As participants discussed, to focus on only one of these dimensions compartmentalised and separated it from the other elements of the system, ignoring the interdependency of the whole system. Striving for healthy people requires a healthy system and therefore, the health of everything which constitutes that system.

Decisions that are embedded within holistic perspectives recognise that management of one part of the farm or the ecosystem has flow on effects for other parts. If one part of the system is non-functioning, for example, pest insects on a crop, being regenerative means meeting this with curiosity and engagement about what in the system is causing it to occur.

> *When [farmers] shift to regenerative approach, …the pest is just a symptom of some parts that they haven't managed to make better. So, they are not looking at the pest as a problem. They're looking at a pest as a cue for what it is that they have to make better. So, they look at, I think they probably see their system more as*

an ally rather than something that they have to control, and tame, and dominate. – Researcher 4

This approach leads farmers to embrace diversity of the more-than-human world to contribute towards balance in their farm (and wider) ecosystem.

Learning process

The process of understanding and re-writing how farmers interact with the world through more-than-human relationships is a significant personal and collective learning process. Regenerative relationships form a basis which farmers can learn and understand their ability to choose management practices or make decisions that support holistic ecosystem regeneration or promote social or physical health. This learning process often involves using the senses such as sight, smell and sound to observe the environment and mimic how nature would work. These individual experiences are pooled through strong peer-to-peer learning networks that utilise social media groups, regenerative field days and workshops to support momentum to think and practice differently. Many farmers note that when making decisions on farm, "the questions keep coming back to how would this work in nature? Instead of, how do I control, how do I dominate, how do I spray and kill?" (Farm Advisor 3). The process of transition to regenerative practices therefore involves a willingness to experiment and make mistakes which can be a significant mindset shift.

A big thing on my regenerative journey, is that I've gone from sort of trying to work out "this works" recipe, to everyday trying to do better than the day before. – Farmer 16

Importantly, the learning process is also reinforced as an ongoing and collaborative process. "Nature is constantly teaching" (Farmer 13) and regenerative farmers must be "prepared to learn, prepared to listen, prepared to take on new things" (Farmer 10) from both human and non-human actors as they continue their journey.

Timescales

The interconnected, relational web that constructs the basis of our world is explored temporally as well as spatially in regenerative decision-making. Most participants referred to future issues in some form, with many referring to timescales beyond one or two human lifespans. Intergenerational thinking becomes an integral part of regenerative decision-making as understanding place within the web of interconnectedness also acknowledges that the web shifts, changes and persists through time.

Oh, you know, the Ballance farm awards[2]? Their [target] is to be sustainable for 100 years. And I'm like, you can't actually put a time... why not a million years? Because sustainability doesn't have a timeline. – Farmer 4

This rethinking of temporalities resonates with Puig de la Bellacasa's (2015; 2017) descriptions of farmers and the soil. Shifting timescales to appreciate the more-than-human has implications for how these farmers make decisions on their farm in the present. Farm management and the role of the farmer in the process is reconceptualised to extend well beyond any individual's life. As such, the decisions made by farmers are reframed as a small but critical contribution towards a collective aspiration of present and future generations that guide long term care for, and with, bodies of the more-than-human care network.

Responsibility

The integration of these timescales and more-than-human webs into decision making inevitably becomes a pathway for farmers to enact ideas of responsibility. Responsibility was most strongly tied to timescales through concepts of intergenerational stewardship. While most farmers, even those in the conventional system likely already feel responsibility for their farm and express the desire to pass it on healthy to the next generation, being regenerative becomes a pathway for farmers to act on these already held ideas of responsibility for their farm. This is something that Farmer 9 specifically notes as "the driving force why we had to change. Because the values of care were there…. And I wasn't able to look after those values and cares by the old conventional system."

If we view farmer relations through this lens of geographies of responsibility it allows a deeper conceptualisation of how regenerative actors are "assigning, accepting, deferring, deflecting or meeting responsibility" (Tronto 2012, p. 308). Farmers are able to accept and meet responsibility through practices rather than only through ideology. This contributes to farmers feeling they can be solutions to issues such as climate change and water pollution, rather than the polluters. Their sense of stewardship radiates beyond their own farm gate, the shared responsibility creating an avenue for collective action. The idea of responsibility for

[2] The Ballance Farm Environment Awards are an annual award presented to the most sustainable farms across New Zealand. The awards are run by one of the two major fertiliser companies in New Zealand, Ballance Agri-Nutrients.

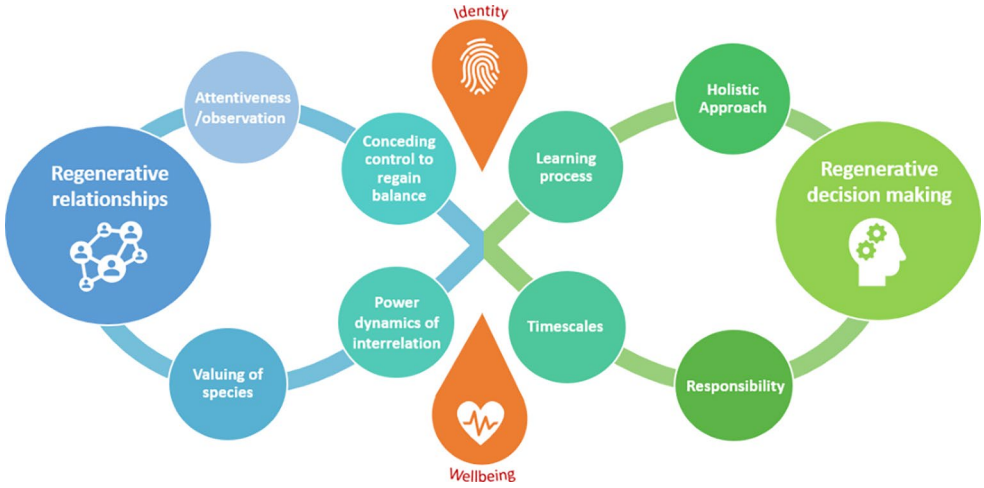

Fig. 1 The regenerative mindset framework: A visual representation of the themes from the interviews and how they interact to contribute to being regenerative. At the intersection of regenerative relationships and regenerative decision making, identity and wellbeing are impacted

regenerative farmers also reflects the need to rethink beyond dependence-based care relations (Noxolo et al. 2012; Raghuram 2016). The mentality of agriculture dominating over the natural environment that is based in colonial constructions of nature can be re-framed through emphasis on co-dependence, reciprocity and co-production. The acceptance and assignment of responsibility by the farmer occurs towards previously inanimate non-humans such as the soil:

> *It's all about looking after Papatūānuku, Mother Earth, and I guess that is the principle of regen ag, looking after the soil and it will look after you. – Farmer 6*
> *I think one of the biggest things for me is that the Whanganui River is actually treated now as a legal entity. I reckon that's pretty cool. I'd love to be able to do something rather like that for our soil, like put it in a covenant that just protected it from future abuses. But I don't know how to do that. – Farmer 16*

We see connections with concepts of reciprocity but also, Farmer 16 shows a desire to derive and embed this responsibility in much larger and more complex relationships with non-human worlds. The granting of legal personhood of the Whanganui River in 2018 was part of a series of major steps forward in recognising te ao Māori as a valued ontological basis for care within western constructs of legislation and environmental management (Winter 2019). To suggest a similar proposal for soil, indicates the extent to which Farmer 16 is recognising the rights of soil and the responsibilities humans have as persons who interact and are interconnected with such a body.

The four components of regenerative decision-making interconnect with the components of regenerative relationships to contribute to the mindset of being regenerative. They can be thought of co-constituting parts of a *regenerative mindset framework* (Fig. 1). But it is also at the intersection of relationships and decision-making where we find that these components are closely tied to the notions of identity and wellbeing of participants. These are discussed below.

The power of being regenerative: impacts on identity and wellbeing

Each of the features of regenerative relationships and decision-making are interconnected to create the mindset shift experienced for farmers to *be* regenerative. The relationships can influence decision-making processes that farmers undertake to run and manage their businesses, farms, and personal lives. And vice versa, decisions made by farmers were found to either initiate attentiveness to or reinforce care-full more-than-human relationships. Therefore, it is this connection that we have used as the basis of the process-based framework created to represent the mindset of being regenerative (Fig. 1).

From the outset, it is important to note that being regenerative is not something that is simply or statically 'achieved'. This distinguishes it from the way undertaking physical practices of regenerative agriculture could be classified and cements being regenerative as a socially engaged process. Being regenerative is fluid and unable to be pinned down as a tick-box exercise. As a mindset shift, the concepts and components of being regenerative flow together, and should be thought of not as separate but more like embodied and conceptual strands that are knitted together. Thus, Fig. 1's shape design is purposeful and represents this interconnection of more-than-human being and doing for participants.

The cumulative effect of these different dimensions of being regenerative creates spaces that are collaborative, interconnected and ultimately, caring. It is through these kinds of relationships where "the magic" and "gold" is of farming regeneratively (Farm Advisor 2), that helps to set 'being regenerative' apart from practicing regenerative agriculture. This is because for many participants, practices of self-reflection and interactions with more-than-human environs amalgamate to produce and maintain a mindset that underpins regenerative relationships and subsequently, endorses regenerative decision-making and behaviour. This process is as important as the physical practices of farming because it is shifting the *why* as well as the *how* of farming to more a more-than-human, care-based paradigm.

Naturally, with such shifts in internal and external mechanisms of thinking, being and doing, being regenerative also was connected to social constructs such as identity and wellbeing. These concepts were found to both influence and be influenced by engagement in regenerative agriculture to create a shift in how farmers perceive the more-than-human world around them and the way they enacted care. Themes of vulnerability, courage, self-care and agency became woven through the regenerative mindset as farmers challenged themselves and their worldviews. Thus, it is this interconnection of relationships, decision-making, identity, and wellbeing where many of the wider implications of being regenerative emerge.

For example, farmers and farm advisors frequently referred to the emotions they experienced through learning about and connecting with the more-than-human world. For example, the expressions of joy where "you couldn't help but smile" (Farmer 12) at the colour and life that non-human bodies such as multi-species pasture brought back to farmscapes. In some cases, being regenerative challenged the masculine farming identity. Farm Advisor 2 noted that "to be stubborn and tough and masculine doesn't allow for much curiosity" that is needed to be regenerative. Some farmers noted they and their friends were more "fluffy" about things such as a protecting ground nesting birds in a paddock (Farmer 4) and Farm Advisor 3 discussed the conversations of self-care they have with their regenerative farmers:

> *If you're working 24 hours in a day, and you're not eating very well, how is that regenerative? How does that fit into what you're trying to do on land? – Farm Advisor 3.*

While more research is required to determine the impacts that being regenerative has beyond an individual level, there are signs that changes to on-farm relationships, decision making and sense of being offers potential for creating larger structural changes in agriculture. Being regenerative offers a lifestyle and a worldview that is much more than technical practices. For some farmers it "re-enthused [their] passion for farming" (Farmer 11). Others were "pumped" to be solutions to climate change (Farmer 4). The sense of purpose that comes with such positive collective belonging contrasts to the narratives of blame that are often put on farmers for environmental and climate issues in New Zealand and beyond. These shifts in mindsets offer promising opportunities for reframing dominant attitudes that shape farming discourse, identities and practices. Revitalised identity/wellbeing provided a greater sense of agency and purpose for participants, a basis for how their social license to farm could be revitalized as well as how they might be a part of that revitalisation.

Connecting regenerative mindsets to food system transformation

Using a relational lens enables the technical practice of regenerative agriculture to be viewed as connected to but not the same as the mindset shift of being regenerative. This creates insight into several features of the regenerative agriculture movement that may otherwise be overlooked. The on-farm practices may indeed create beneficial environmental outcomes, but the mindset is what makes people within the regenerative movement radical and transformative. This is because viewing the world relationally and with care challenges deep-seated values, attitudes, and assumptions about how agriculture should exist. A MTH EoC lens enables these aspects of the regenerative agriculture movement to be highlighted and suggests the potential for change beyond individual farm practices.

For example, farmers are tapping into more-than-human networks, which can vary from relationships with microbiology in the soil, to global online communities in the movement. A MTH EoC lens highlights how the social aspects of these spaces are essential to supporting the mindset shift. Many farmers enjoyed being able to collectively identify, not necessarily with the term regenerative agriculture, but with a group of farmers with shared experiences and challenges.

> *I think with having the [community group], it's actually got me out of... got people out of their shells.* ***It's actually made people think that 'I'm not that alone'****. I can actually talk about what I'm doing…my cards aren't quite so close to my chest now. Like* ***I always enjoyed sharing what I was doing, but no one used to listen****. – Farmer 12 (author's emphasis)*

Surrounding themselves with like-minded people and tapping into peer-to-peer learning networks was considered essential for support. Because farmers are undertaking regenerative journeys that often result in changing not only their physical practices but also their thinking, farmers are essentially changing their paradigms and worldviews. Thus, finding these support systems aids what can be a challenging period for many people as they begin to unlearn much of what guides their existing worldview. As such, these farmers are networking and extending their care networks across distance and beyond their own individualised farms.

Regenerative mindsets also stem from a shift in socio-ecological relations. Being truly regenerative highlights human-nature connections and demands a reconfiguration of humanity's place in a world of more-than-human webs. It aids the reframing of humans from being at the top of the hierarchy to being within a "horizontal web of interdependency between all matters" (Beacham 2018, p. 539). Farmers can be part of a system that is "more than just about them" (Farmer 13) or their own needs and requirements for production. This is a significant part of the paradigm shift where "we're talking about change from a central control, kind of command control to around equity and mutualism" (Farm Advisor 4). These changes are not accounted for in the methods used to assess the sustainability of farms or wider system change. The strong focus on quantifiable biophysical markers such as water quality, soil nutrients and biodiversity, while critical to ecological health, overlook deeper conditions of mindset shifts and the impact they have of dimensions such as farmer identity and wellbeing. A MTH EoC lens instead highlights these and labels mindset shifts as a key component of system change. 'Being regenerative' is helping farmers to address the root cause of environmental issues: the perceived separation of society and nature. Being regenerative requires people to "feel" rather than only see the results of regenerative agriculture (Farm advisor 2). It demands a connection to the earth and the people around them that is deeper than simply filling a tick box exercise to achieve a regenerative certification.

> *When you walk into your property and you put a spade in the ground, which people become addicted to, that you pick up that soil and bring it up to your nose and take a whiff. It just fills you with something and that's not so easy to measure. – Farm Advisor 2*

A potential strength of paying more attention to the mindset is that in contrast to technical practices, it is not easily captured or co-opted for the purposes of creating marketable brands or certifications. Furthermore, acknowledging the power that sits in the relations of a mindset recognises the potential it has to navigate and create change far beyond the farm gate and the place-based restrictions of a physical practice. A key feature of an ethic of care is that care is based on a collaborative rather than individual form of interrelation that can then blur and flatten any presumed boundaries of scale. When participants were asked to describe what regenerative agriculture meant to them, they overwhelmingly identified the features of the mindset, rather than on-farm practices (see Fig. 2). This lack of agricultural focus when describing regenerative agriculture indicates that the mindset includes opportunities for personal and community growth to occur as a result of the dialectical relationship between knowing, being and doing agriculture differently. And it is this shift that appears to be most meaningful to participants.

Therefore, a relational approach to analysing regenerative agriculture emphasises that 'being regenerative' is not specific to agriculture. It is an individual mindset that grows out of interpersonal relations and an ethic of care for the community of humans and non-humans alike. Therefore, it has potential to influence wider structural power dynamics at community, regional and national levels and be applied as a design tool that concerns the processes of thinking, being, and doing at different scales of system change.

Conclusion

The use of a MTH EoC to analyse regenerative agriculture in New Zealand revealed the importance of distinguishing between the practice of regenerative agriculture and being regenerative. Thus far, the literature on regenerative agriculture has largely focused on the assessment of practice, and our purpose was to draw attention to the processes involved in being regenerative. While the two overlap, it is the mindset that is crucial to the transformational potential of regenerative agriculture. A MTH EoC lens creates opportunities for a relational approach to be used to understand the transformation of socio-ecological systems such as agriculture. Using a MTH EoC lens demands attention to our everyday socio-ecological relationships in agriculture and doing so makes the connection between mindset and practice visible as a key part of the regenerative movement. Re-framing the world with this lens has implications for how agriculture exists and the narratives that are visible in agricultural spaces. Thinking, being and doing differently encourages more a care-full direction for agriculture and is a fundamental shift away from a reductionist and productivism-based paradigm. Being regenerative creates space for care in agriculture and when people are forming regenerative relationships and making regenerative decisions, there is a mentality that can also be applied to any aspect of life rather than solely to the farm.

Fig. 2 Word cloud showing the lack of agriculture in 'being regenerative'. This word cloud is produced from participant responses to the question "If you could use 2–3 words to summarise your sentiments for regenerative agriculture, what would they be?". Words in a larger font were mentioned more frequently. The only two agriculture related responses were "soil" and "just farming"

Thus, without an analytical lens that can value these outcomes of regenerative agriculture, the transformational potential of the movement could go unseen. A MTH EoC reveals the links between relationships and decision-making that shape the practice of being regenerative that would otherwise go under analysed and undervalued when considering its potential to contribute toward agri-food system transformation. For example, creating the space to highlight ideas such as identity, wellbeing and other intimate emotions allows these relationships to be better understood and valued as points of internal-external transformation. These aspects are crucial to transformation because they contain the mindset shift which is vital to making long-term, permanent change in human behaviour and human-nature relations.

The processes of change highlighted through the mindset framework provide an insight into where and how sustainability and regenerative thought and practice evolves. When we talk about transforming polluting and unjust agri-systems, we need to understand system change as starting from and emanating from mindset changes if we are to address the fundamental issue of a perceived human-nature separation. While our focus was on the shifts in mindsets of individual farmers, there are potential research opportunities to extend this analysis across scales. For example, linking the mindset framework to a multi-level perspective analysis could provide further insight into how niche-level changes that are currently underway interact with existing regimes that shape agricultural practice. The regenerative mindset framework created from relational analysis of regenerative agriculture provides a glimpse of how this paradigm shift is functioning. It is messy, interconnected and personal. Yet there is a significant gap between these individual level changes and calls that we need paradigm shifts in our worldview of socio-ecological relations (Alkon 2013; Moragues-Faus and Marsden 2017; West et al. 2020). Being regenerative provides a glimpse of the mindset and therefore the seeds of such a shift.

Despite this messiness, insights gained from a MTH EoC analysis of regenerative agriculture are critical for creating supportive structures to cultivate and encourage the productive spaces that do exist, i.e., that of mindset shifts. Research and investment into creating pathways for the implementation of sustainable technology and practices are common. Further research is needed to determine how we might develop, assess or integrate measures of mindset shifts associated with being regenerative. It is critical that we address the question "how can we create pathways for new mindsets to spread?" from a socio-ethical and relational perspective alongside the research taking place on regenerative practices such as soil health and biodiversity. A MTH EoC lens can be an important tool for this analysis and contribute towards an understanding of how to create a new natural-social contract within agriculture (Huntjens 2021). But, the potential

of MTH EoC also lies in its ability to be applied in decision-making alongside being a tool for academic analysis. As found in this research, regenerative actors are re-evaluating their role in society and what is fit for purpose through the mindset of being regenerative, underpinned by a MTH EoC worldview. This highlights the importance of embedding more-than-human care into both academic analysis and on-the-ground system change narratives. A relational lens reinforces the importance of political decisions recognising the interconnection between all systems. More-than-human care ultimately challenges many of the approaches that our society uses that result in exploitative systems (Moriggi et al. 2020). This is because it encourages us to flip how western paradigms think about socio-ecological connections and therefore how we think about solutions to some of our greatest challenges.

In this research, care has been applied as a research lens and a research ethos to look at caring practice in regenerative agriculture in response to the need for broader theoretical approaches to transformative agri-food politics (Tregear 2011). A MTH EoC contributes to a more rounded grasp of change as it reveals the ways in which social and mindset shifts are occurring and have transformative potential in regenerative agriculture spaces. However, currently system change analysis rarely accounts for relational care. Some literature has started to investigate the ability to integrate loops of care for people and environment into frameworks for sustainable or circular economies (Schildberg 2014; Pla-Julián and Guevara 2019). However, mostly, an ethic of care lens remains bound to care-work practices rather than applying care in other sectors such as agriculture. Bringing more-than-human care to the forefront of wider system change analysis has potential to widen transformation analysis by offering a relational approach that can more directly acknowledge the power of social constructs to guide sustainability pursuits.

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References

Alkon, A. H. 2013. The socio-nature of local organic food. *Antipode* 45 (3): 663–680.

Beacham, J. 2018. Organising food differently: Towards a more-than-human ethics of care for the Anthropocene. *Organization* 25 (4): 533–549.

Booth, K. I. 2013. Deep ecology, hybrid geographies, and environmental management's relational premise. *Environmental Values* 22 (4): 523–543.

Brown, G. 2018. *Dirt to soil: One family's journey into regenerative agriculture*. White River Junction, Vermont: Chelsea Green Publishing.

Brown, K. 2014. Global environmental change I: A social turn for resilience? *Progress in Human Geography* 38 (1): 107–117.

Burns, E. A. 2020. Thinking sociologically about regenerative agriculture. *New Zealand Sociology* 35 (2): 189–213.

Burton, R. J. F., J. Forney, P. Stock, and L. Sutherland. 2020. *The good farmer: Culture and identity in food and agriculture*. London: Routledge.

Campbell, H. 2020. *Farming inside invisible worlds: Modernist agriculture and its consequences*. London: Bloomsbury Publishing Plc.

Conradi, E. 2015. Redoing care: Societal transformation through critical practice. *Ethics and Social Welfare* 9 (2): 113–129.

Cope, M. 2016. Organising and analysing qualitative data. In *Qualitative research methods in human geography*, ed. I. Hay, 4th edition, 373–393. Ontario: Oxford University Press.

Fisher, B., and J. C. Tronto. 1990. Towards a feminist theory of caring. In *Circles of care: Work and identity in women's lives*, eds. E. K. Abel, and M. K. Nelson, 36–54. New York: SUNY Press.

Folke, C., S. R. Carpenter, B. Walker, M. Scheffer, T. Chapin, and J. Rockström. 2010. Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society* 15 (4): 20.

General Mills. 2021. General Mills Inc. 2021 Global Responsibility Report. https://globalresponsibility.generalmills.com/HTML1/general_mills-global_responsibility_2021_0036.htm. Accessed 10 May 2021.

Gibson-Graham, J. K., and G. Roelvink. 2010. An economic ethics for the Anthropocene. *Antipode* 41 (1): 320–346.

Gosnell, H., N. Gill, and M. Voyer. 2019. Transformational adaptation on the farm: Processes of change and persistence in transitions to 'climate-smart' regenerative agriculture. *Global Environmental Change* 59: 101965.

Gottschlich, D., and L. Bellina. 2017. Environmental justice and care: Critical emancipatory contributions to sustainability discourse. *Agriculture and Human Values* 34 (4): 941–953.

Grelet, G., and S. Lang. 2021. Regenerative agriculture in Aotearoa New Zealand: Research pathways to build science-based evidence and national narratives. https://ourlandandwater.nz/wp-content/uploads/2021/03/Grelet_Lang_2021_Regen_Ag_NZ_White_ePaper.pdf. Accessed 27 April 2021.

Harrison, P., and B. Anderson. 2010. The promise of non-representational theories. In *Taking-place: Non-representational theories and geography*, ed. P. Harrison, 1–34. Farnham: Routledge.

Hikuroa, D. 2017. Mātauranga Māori—the ūkaipō of knowledge in New Zealand. *Journal of the Royal Society of New Zealand* 47 (1): 5–10.

Holland, P., K. O'Connor, and A. Wearing. 2002. Remaking the grasslands of the open country. In *Environmental histories of New Zealand*, eds. E. Pawson, and T. Brooking, 69–83. Auckland: Oxford University Press.

Huntjens, P. M. J. M. 2021. *Towards a natural social contract: Transformative social-ecological innovation for a sustainable, healthy and just society*. Cham: Springer.

Jellie, H. 2020. An introduction to the principles of being regenerative. Ata Regenerative. https://ata.land/introduction-principles-regenerative/. Accessed 11 June 2020.
Krzywoszynska, A. 2019. Caring for soil life in the Anthropocene: The role of attentiveness in more-than-human ethics. *Transactions of the Institute of British Geographers* 44 (4): 661–675.
LaCanne, C. E., and J. G. Lundgren. 2018. Regenerative agriculture: Merging farming and natural resource conservation profitably. *PeerJ* 6: e4428.
Lamine, C., I. Darnhofer, and T. K. Marsden. 2019. What enables just sustainability transitions in agrifood systems? An exploration of conceptual approaches using international comparative case studies. *Journal of Rural Studies* 66: 144–146.
Masters, N. 2019. *For the love of soil: Strategies to regenerate our food production systems*. New Zealand: Printable Reality.
McClintock, N. 2014. Radical, reformist, and garden-variety neoliberal: coming to terms with urban agriculture's contradictions. *Local Environment* 19 (2): 147–171.
McEwan, C., and M. K. Goodman. 2010. Place geography and the ethics of care: Introductory remarks on the geographies of ethics, responsibility and care. *Ethics Place & Environment* 13 (2): 103–112.
MfE, and N. Z. Stats. 2019. New Zealand's environmental reporting series: Environment Aotearoa. New Zealand Government. https://www.mfe.govt.nz/publications/environmental-reporting/environment-aotearoa-2019. Accessed 16 May 2020.
Moragues-Faus, A., and T. Marsden. 2017. The political ecology of food: Carving 'spaces of possibility' in a new research agenda. *Journal of Rural Studies* 55: 275–288.
Morgaine, K., L. Thompson, K. Jahnke, and R. Llewellyn. 2017. GoodYarn: Building mental health literacy in New Zealand's rural workforce. *Journal of Public Mental Health* 16 (4): 180–190.
Moriggi, A., K. Soini, A. Franklin, and D. Roep. 2020. A care-based approach to transformative change: Ethically-informed practices, relational response-ability & emotional awareness. *Ethics Policy & Environment* 23 (3): 281–298.
Nestlé. 2021. Accelerate, transform, regenerate: Nestlé's net zero roadmap. https://www.nestle.com/sites/default/files/2020-12/nestle-net-zero-roadmap-en.pdf. Accessed 10 May 2021.
New Zealand Productivity Commission. 2018. Low-emissions economy. https://www.productivity.govt.nz/inquiries/lowemissions/. Accessed 24 February 2019.
Noxolo, P., P. Raghuram, and C. Madge. 2012. Unsettling responsibility: Postcolonial interventions. *Transactions of the Institute of British Geographers* 37 (3): 418–429.
One News. 2019. Hundreds of farmers march on parliament protesting emissions targets, water regulation. TVNZ. https://www.tvnz.co.nz/one-news/new-zealand/hundreds-farmers-march-parliament-protesting-emissions-targets-water-regulation. Accessed 25 May 2021.
Orr, D. 2002. Four challenges of sustainability. *Conservation Biology* 16 (6): 1457–1460.
Parsons, M., J. Nalau, and K. Fisher. 2017. Alternative perspectives on sustainability: Indigenous knowledge and methodologies. *Challenges in Sustainability* 5 (1): 7–14.
PepsiCo. 2021. PepsiCo announces 2030 goal to scale regenerative farming practices across 7 million acres, equivalent to entire agricultural footprint. PepsiCo, Inc. Official Website. http://www.pepsico.com/news/press-release/pepsico-announces-2030-goal-to-scale-regenerative-farming-practices-across-7-mil04202021. Accessed 10 May 2021.
Pla-Julián, I., and S. Guevara. 2019. Is circular economy the key to transitioning towards sustainable development? Challenges from the perspective of care ethics. *Futures* 105: 67–77.
Puig de la Bellacasa, M. 2010. Ethical doings in naturecultures. *Ethics Place & Environment* 13 (2): 151–169.
Puig de la Bellacasa, M. 2015. Making time for soil: Technoscientific futurity and the pace of care. *Social Studies of Science* 45 (5). SAGE Publications Ltd: 691–716.
Puig de la Bellacasa, M. 2017. *Matters of care: Speculative ethics in more than human worlds*. Minneapolis: University of Minnesota Press.
Raghuram, P. 2016. Locating care ethics beyond the global north. *ACME* 15 (3): 511–513.
Rhodes, C. J. 2017. The imperative for regenerative agriculture. *Science Progress* 100 (1): 80–129.
Rodale Institute. 2019. The original principles of regenerative agriculture. Rodale Institute. https://rodaleinstitute.org/blog/original-principles-of-regenerative-agriculture/. Accessed 19 May 2020.
Schildberg, C. 2014. A caring and sustainable economy: A concept note from a feminist perspective. Friedrich Ebert Foundation. http://library.fes.de/pdf-files/iez/10809.pdf. Accessed 18 June 2020.
Siegfried, A. 2020. Insight into regenerative agriculture in New Zealand: The good, the bad, and the opportunity. Pure Advantage. https://pureadvantage.org/news/2020/04/30/insight-into-regenerative-agriculture-in-new-zealand-the-good-the-bad-and-the-opportunity/. Accessed 5 August 2020.
Soloviev, E. R., and G. Landua. 2016. Levels of regenerative agriculture. Terra Genesis International. https://ethansoloviev.com/wp-content/uploads/2019/02/Levels-of-Regenerative-Agriculture.pdf. Accessed 27 April 2020.
Sundberg, J. 2014. Decolonizing posthumanist geographies. *Cultural Geographies* 21 (1): 33–47.
The Carbon Underground. 2017. Regenerative agriculture definition. The Carbon Underground. https://thecarbonunderground.org/our-initiative/definition/. Accessed 19 May 2020.
Tregear, A. 2011. Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of Rural Studies* 27 (4): 419–430.
Tronto, J. C. 2012. Partiality based on relational responsibilities: Another approach to global ethics. *Ethics and Social Welfare* 6 (3): 303–316.
Valentine, G. 2005. Tell me about… Using interviews as a research methodology. In *Methods in human geography: A guide for students doing a research project*, eds. R. Flowerdew and D. Martin, 2nd edition, 110–127. Essex: Pearson Education.
Webb, P., T. G. Benton, J. Beddington, D. Flynn, N. M. Kelly, and S. M. Thomas. 2020. The urgency of food system transformation is now irrefutable. *Nature Food* 1 (10): 584–585.
West, S., L. J. Haider, S. Stålhammar, and S. Woroniecki. 2020. A relational turn for sustainability science? Relational thinking, leverage points and transformations. *Ecosystems and People* 16 (1): 304–325.
Whyte, K. P., and C. Cuomo. 2016. Ethics of caring in environmental ethics: Indigenous and feminist philosophies. In *Oxford handbook of environmental ethics*, S. M. Gardiner, and A. Thompson, eds. Vol, 1, 234–248. Oxford University Press.
Willett, W., J. Rockström, B. Loken, M. Springmann, T. Lang, S. Vermeulen, and T. Garnett, et al. 2019. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet* 393 (10170): 447–492.
Winter, C. J. 2019. Does time colonise intergenerational environmental justice theory? *Environmental Politics* 29 (2): 278–296.

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