Digging for nature: human-nature relations in the context of growing plants

Paula Novo, Anja Byg & Scott Herrett

View supplementary material

Published online: 13 Jun 2024.

Submit your article to this journal

Article views: 764

View related articles

View Crossmark data

Citing articles: 3 View citing articles

Taylor & Francis
Taylor & Francis Group

RESEARCH: A RELATIONAL TURN IN SUSTAINABILITY

OPEN ACCESS
Check for updates

Digging for nature: human-nature relations in the context of growing plants

Paula Novo [a], Anja Byg [b] and Scott Herrett [c]

aSustainability Research Institute, School of Earth and Environment, University of Leeds, Leeds, UK; bConservation Science Department, Royal Society for the Protection of the Birds, Sandy, UK; cFriends of the Earth Scotland, Aberdeen, UK

ABSTRACT

This study focuses on the interplay between specific relations to nature and more abstract concepts and values regarding the nature of humans and nature and the relationships between humans and nature. We conducted Q sorts and interviews with 25 individuals who were growing plants in gardens, allotments or different kinds of agricultural settings in Scotland. We identified three discourses representing different ways of conceptualising human-nature relationships, namely: 1) Guardianship of fragile nature; 2) Partnership with powerful nature; and 3) Rational anthropocentric management. The different discourses implied different ways of approaching environmental issues and the right way for humans to relate to nature. While the three discourses represented different understandings of human-nature relations, there was also overlap and similarities amongst them. Cross-cutting themes included the notion of balance as a central aim of many 'growers' and learning as an important part of growing plants. The study also showed that the respondents' own practices did not neatly map on to single abstract perspectives, with individuals often drawing on elements of different discourses and commenting on their contradictions. Ultimately, this connected to the question on how to find the right balance between human and non-human interests. Bringing in a relational understanding and acknowledging the plurality of perspectives on human-nature relations, as well as their contradictions, overlaps and tensions, can open up the space for alternative narratives to be reflected in policies but also that structural and systemic changes are required for people to cultivate more benign relations with other-than-humans.

KEY POLICY HIGHLIGHTS

- We identify three discourses representing different ways in which people growing plants conceptualise human-nature relationships.
- Discourses imply different understandings of the role of humans, nature and environmental (biodiversity) management.
- Results point towards paradoxes and tensions and the struggle to balance different needs, often made more difficult by existing structural and systemic issues.
- A key question across discourses is how to find the right balance between human and non-human interests.
- Acknowledging plurality of discourses on human-nature relations, as well as their contradictions, overlaps and tensions, can open up space for policies to integrate alternative narratives and hence other types of behaviours and ways of being in relation to nature.

1. Introduction

People grow plants for many reasons and in different ways ranging from the creation of aesthetically pleasing gardens to large-scale food production. No matter the scale or the aim, growing plants involves actively intervening and relating to a patch of ground and all the other-than-humans who live there, whether plants, animals, fungi, microorganisms or other. As such, growing plants expresses very specific relationships in a particular context while arguably also being connected to more general value frames and worldviews. In this study, we look at the diversity of growers' perspectives in how they conceptualise the relationship between humans and nature[1] in general, and how they understand and enact their own role as active participants in human-plant-soil relations. We explore this in a variety of contexts in northeast Scotland, ranging from private gardens, to allotments, to different kinds of farming (conventional, organic and permaculture).

Our study is part of a renewed interest in relationality and understanding the world through the perspectives of relations and processes rather than focusing on substances and entities (e.g. Hertz et al. 2020; Mancilla García et al. 2020; West et al. 2020; Gould et al. 2023). Relations are an essential aspect of

existence for all beings, human and other-than-human, and are fundamental to our (well)being in the world (Weber 2019). It is through relations that we satisfy our material, emotional and psychological needs and that we can experience and know the world. Relational approaches therefore focus on relations as dynamic processes through which things come into being and exist. This can be clearly seen in spaces such as gardens, allotments and farms where humans actively remove, limit, add or encourage particular species and individuals by relating to them in certain ways and practices. At the same time, human participants may also be changed and affected by these interactions (Country et al. 2016).

Focusing on how dynamic relations are enacted through specific practices and shaped through experiences arising from interactions helps to extend the concept of agency from a narrow focus on consciousness and intent, thereby broadening what or whom we include as active agents (West et al. 2019, 2020; Mancilla García et al. 2020). Instead of focusing on humans as the ones who make and impose decisions, a relational approach can help us understand the way in which humans, plants, soils, animals, microbes, climate and many others together create habitats such as gardens and fields through their interactions and relations.

Relational practices are embedded and shaped by relations of power as well as the wider context in which they take place from worldviews and values to structures, institutions and access to resources (Tronto 1993; Puig de la Bellacasa 2017). A focus on relations therefore still requires consideration of values, power and structure (Plumwood 1993; Pungas 2022).

Many studies looking at sustainability and conservation from a relational point of view have emphasised relational values that are 'pro-environment' (Hoelle et al. 2022). However, relational values are not per se supporting reciprocal and sustainable ways of interacting with nature. Relational values, which are usually defined as the preferences and principles that guide or are expressed in relationships, can promote sustainable as well as unsustainable ways of relating (Chan et al. 2016; Hoelle et al. 2022). For example, in the Cartesian worldview nature is seen as machine-like as well as inferior to humans, and therefore as something to be exploited and controlled by humans (Plumwood 1993; Hall 2011; Hoelle et al. 2022). This influence of Cartesian thinking can still be seen in current high-level policy recommendations such as the Dasgupta Review (2021) underpinned by 'utilitarian environmentalism' and instrumental arguments (Muradian and Gomez-Baggethun 2021). While nature may still be deemed valuable in this framing, it is essentially reduced to means to a (human) end (Plumwood 1993; Armstrong 2022). In contrast, understandings of nature as other-than-human persons who have agency and wish to flourish entail very different understandings of how one should interact with them (Harvey 2005; De la Cadena 2015). Studying a diversity of relations and relational values and their implications for the environment can help to understand what factors enable more sustainable ways of relating and interacting with the environment (Hoelle et al. 2022).

While such framings of human-nature relations and associated values are of a universal and abstract nature, relations are always with specific humans and other-than-humans and take place in particular contexts, including institutions and structures (Chan et al. 2018; Muradian and Pascual 2018). Together with the more general values, these specificities influence how relations play out. At the same time, experiences arising from specific relations may also influence the more abstract concepts and values, though this never happens in simple or straightforward ways (Kenter et al. 2019). Different and apparently contradictory notions and values may be held at the same time, and these may yet again be different from the practices and interactions through which particular relationships are enacted (Fischer and Marshall 2010; Brown et al. 2021). Disentangling the connections between general framings of relations and values to practices, can help us uncover the complexity of these relations.

Our research study focuses in particular on understanding the diversity of perspectives that conceptualise people's relationships with nature in the context of growing plants and how they understand and enact their own role in these contexts. We were especially interested in exploring the ways in which our participants understood the nature of nature, the nature of humans and the relationship between humans and nature. We focused on spaces and practices of growing plants due to the active and intentional role humans take in creating and shaping these spaces (although the outcomes may not always reflect their intentions). As we were interested in how growers enact their own role at the interplay between general notions and values and specific contexts, we included a number of different 'growing environments' from gardens to allotments to different kinds of farms (conventional, organic and permaculture). We were particularly interested in the choices that the human participants have to make about how to relate and how to balance their own desires for food or aesthetics with those of the other-than-human participants. Growing spaces thus epitomise some of the dilemmas inherent in all relations (García-Antúnez et al. 2023). Furthermore, gardens, allotments and farmland and the particular practices associated

with them all play important roles in terms of biodiversity as well as soil fertility and conservation.

This work therefore aims to be an empirical contribution to the literature on human-nature relationships and their connections to specific practices and actions in the context of growing plants. While we focused on 'growing environments' similar questions could have been explored in other environmental decision-making contexts, e.g. fishing, forestry, pro-environmental behaviours, etc.

2. Methods

We employed Q methodology and in-depth semi-structured interviews to investigate perspectives on relationships to nature and soil and biodiversity management practices. Q methodology is a quali-quantitative method used to explore subjective views on a given topic (Watts and Stenner 2012). This is done by developing a set of statements that capture distinct perspectives on the topic and asking respondents to sort the statements into a grid reflecting their relative agreement with each statement (see Figure 1). Discourses representing different social perspectives are then extracted by using factor analytical approaches to respondents' sorting of statements (Q sorts) and integrating these patterns of similarities with qualitative information on the reasons underlying these patterns. This allows the identification of distinct perspectives existing within a group about a specific topic. In Q methodology, a factor represents a particular arrangement of Q statements. This is the 'idealised Q sort' that a participant would have if they share the exact same opinion as the viewpoint represented by the factor. In practice, perfect loadings on one factor only are unlikely to happen, but factors represent approximations to the viewpoints shared by a particular group of observed Q sorts (Watts and Stenner 2012). While Q methodology allows us to understand what perspectives are present within the wider body of discourses on a particular topic, it doesn't allow inferences about how widespread these perspectives are in a population. Q methodology does not require a representative sample of the larger population but a diverse set of participants. Thus, participants are often selected purposively based on their relevance to the topic area.

In this study we selected participants to represent a diversity of growing contexts and experiences ranging from conventional and organic farms to allotment spaces and private gardens. Altogether, we conducted 25 sorting exercises and interviews with 27 people (two interviews were with couples) in the period from September 2019 to June 2020. While Q interviews are generally done with one individual at a time, we had two instances were the main participant was an individual accompanied by a family member who was part of the decision-making in the farm or garden. This is an unusual situation from a Q perspective, but it reflects the reality of decision-making processes in these contexts and the ways in which perspectives often arise from interactions between people. Interviews with couples were treated for the purpose of this study as a unit. Very similar results are obtained when excluding the interviews done with couples from the analysis, i.e. the factors and their loadings do not significantly change. We have included these extra analysis in Tables S2 and S3 in the supplementary information.

All participants were based in Scotland. The research received ethical clearance from the Research Ethics Committee of the James Hutton Institute. All participants gave written or verbal consent for the interviews to be recorded, transcribed and used for the analysis. Their anonymity has been preserved throughout the study. A structured Q methodology protocol followed by a semi-structured interview was used for data collection. All interviews except four were conducted in person using laminated cards and a printed Q grid (see Figure 1) so the participants could engage directly with the sorting process. Due to the

Figure 1. The Q methodology grid used for this study.

lockdown restrictions during the COVID-19 pandemic in 2020 the last interviews were conducted online following a similar process as the in-person interviews.[2] Participants were selected purposively to represent different farming styles and growing practices, including urban allotments, gardens, and professional farmers, and covering conventional, organic and permaculture practices. Table 1 provides an overview of the study participants.

Our starting point for constructing the Q set is the typology of seven human-nature relational models put forward by Muradian and Pascual (2018). As established by Watts and Stenner (2012), Q sets can be generated based on existing theoretical frameworks and/or empirical evidence on the range of opinions regarding the topic. While the latter is often the most common practice in Q studies, in our study we combine the two, starting with statements reflecting the relational models in Muradian and Pascual (2018) and then looking at empirical literature to address gaps in terms of additional aspects of human-nature relations. The typology of relational models developed by Muradian and Pascual (2018) represents elementary forms of human-nature relations that can be identified across cultures. Muradian and Pascual (2018) argue that there is a finite number of cognitive frames defining human-nature relations and that different values can be associated with different relational models and hence with different interactions and policy options. According to the authors, the following five dimensions define human-nature relational models: ontology, goal orientation, emotional drivers, practices and main mode of interaction. Q statements in our study focused on the ontology, goal orientation and practice dimensions. Specific practices in the farm and/or garden, and emotional drivers, were further covered by semi-structured interviews after the Q sorting process. *Ontology* refers to the degree of differentiation between nature and humans, whether non-humans have any agency, and how nature is positioned with respect to humans. *Goal orientation* focuses on the main goals guiding decision making. *Emotional drivers* focus on the feelings and emotions underlying behaviours and decisions, and *practices* define what can or cannot be done in a particular context. The analysis of the Q sorts and qualitative information allowed us to define the discourses reflecting *the main mode of interaction*. Development of the

Q statements was further supplemented by reviewing and drawing on additional literature on humans, nature and human-nature relations to ensure that the statements covered a diversity of existing perceptions (Flint et al. 2013; Roundtree 2012; Bain et al. 2012; Fischer 2010; Buijs et al. 2008; Vining et al. 2008, among others).

The study included 53 statements out of an initial list of 74 statements. The longer Q set was piloted with three respondents after which redundant or less relevant statements were removed to maintain representativeness and balance in the final set design, and avoid overburdening respondents with a long list of statements. Small adjustments to the phrasing of some statements were also done to reduce ambiguities. Participants in the pilot were people working in the field of human-nature relations and familiar with the study context. The first part of the interviews focused on the Q-sort, where we asked the participants to sort the different statements according to their level of agreement or disagreement with each statement. This process was broken down into two steps. First participants were asked to sort the statements into three piles indicating which ones they agreed, disagreed or felt neutral or mixed about. In a second step they were asked to place statements from one pile at a time in a preconfigured distribution grid (see Figure 1) representing the degree of agreement or disagreement they felt about each ranging from 'least agree' (−4) to 'most agree' (+4). The shape of the grid forced the choice of three top statements at both ends. It is important to note that sorting in the grid represents a relative rather than absolute level of agreement or disagreement with the statements. This means that those statements placed at the extremes are most relevant to respondents compared to the others placed towards the centre of the distribution. To understand participants' reasoning behind the way they sorted the Q-statements, we followed up the sorting exercise with semi-structured interviews where we looked at where they had placed the statements.

The second part of the interviews focused on participants' practices, experiences and goals in relation to growing plants. Where possible, this was followed (or sometimes preceded) by a walk around the participant's garden, allotment or farm. This enabled participants to talk in more depth about the different practices they employed (ranging from the kinds of plants they grew to crop rotations and soil treatment and to dealing with pests as well as employing 'wildlife friendly' practices), but also sometimes elicited more reflections about their own role and emotions in relation to their plot.

Interviews were fully transcribed and qualitatively analysed in NVivo software using a combination of pre-defined themes and open coding, thus allowing

Table 1. Number of participants per group.

Group	Number of participants
Allotment gardeners	11
Home gardeners	7
Farmers	7
Conventional	3
Organic	3
Permaculture	1

for themes to emerge from the data as well as reflecting our interest in exploring different conceptualisations of human-nature relations. The quantitative analysis was done using the 'qmethod' package (version 1.5.5) (Zabala 2014). We used Principal Component Analysis (PCA) to extract factors from the perspectives represented by the Q sorts (Watts and Stenner 2012). Factors were subjected to varimax rotation. The final factor solution was arrived at by combining the quantitative results with the qualitative analysis of the interview transcripts, leading to the development of discourses.

3. Results

A 3-factor solution was selected as it satisfied the objective criteria for factor choice and produced coherent and meaningful qualitative discourses (Watts and Stenner 2012). Together, they explained 63% of the variance. Of the 25 Q sorts, 17 loaded significantly onto one of the factors. The remaining 8 Q sorts did not load significantly on any of the factors. Factor loadings are presented in Table S1. A 4-factor solution was also considered but one of the factors only had one Q sort associated, therefore the 3-factor solution produced more reliable results.

The three identified discourses each represent a unique social perspective on human-nature relationships and their implications in terms of biodiversity and soil management. We labelled the discourses as: Discourse 1: Guardianship of fragile nature; Discourse 2: Partnership with powerful nature; and Discourse 3: Rational anthropocentric management. All perspectives emphasised the importance of nature and the differences across them lie mainly in how they conceptualise the role of humans and the nature of nature. Table 2 reports the numeric characterisation of the discourses showing the idealised Q sorts associated with each perspective. Idealised Q sorts are derived from the z-cores and they represent the scores discourses would give to each statement. Additionally, consensus (i.e. statements on which all factors/discourses agree) and distinguishing statements (i.e. statements that are unique to certain factors/discourses) are identified based on the degree of statistical distinction between the factors. This helps to build the narratives about the discourses and to understand their similarities and differences. The following sections provide a description and interpretation for each discourse. We refer to statement numbers and their idealised score in parentheses (S#: idealised score), and mark with an asterisk distinguishing statements for each factor or those distinguishing all factors. Anonymised quotes from the interviews

are also used to illustrate the key ideas within each discourse.

3.1. Discourse 1: guardianship of fragile nature

Discourse 1 is associated with 8 Q sorts from three allotment holders and five gardeners and explains 25% of the variance. It emphasised ideas of human responsibility (S37:+4) both in terms of causing environmental problems (S39*:+4) and remediating these problems (S24*:+3). Humans were thus seen both as a threat to nature as well as being (potential) guardians (S6*:+2). The threat to nature may be linked to notions about humans being selfish (S7*: +1) as well as knowing less than they think (S50*:+2). Views of nature were complex: while nature was seen as active (S15*:-1), it was not seen as creative (S53*:0) and there was less agreement with nature being resilient (S38*:0), powerful (S2*:+1) and hostile (S44*: −3) compared to the other discourses. While nature was not seen as a collection of resources (S31*:-1), it was also not seen as sacred, sentient or a divinity (S11*:-2, S12*:-1 and S46*:-2).There was more agreement with the statement that the objective of environmental management should be to minimise negative impacts on the environment (S24*:+3) compared to the other discourses, and more disagreement with environmental problems being more important than human/social problems (S4*:-3). This discourse also emphasised that environmental management should work with nature and its processes (S45:+4) and ensure that nature remains wild (S48*: +1), while strongly disagreeing with the ideas that nature is a threat (S52:-4) and that humans are positioned outside of nature (S42:-4).

The qualitative analysis of the eight interviews exemplifying this discourse supported and added further nuances to the picture. As already indicated by the quantitative analysis, nature as well as humans were seen to be complex and to hold apparent contradictions: nature was not seen as sentient or ensouled but nevertheless as having some agency and being able to react and self-regulate albeit within certain limits. However, these limits were in many cases seen to have been breached by humans as illustrated by the following quote:

> Nature is resilient, but even something that's resilient up to a point, I think there's too many human camels, or straws rather. [...] Self-regulating and resilient for me are kind of going together, but again [...], you can only be resilient up to a point. (Garden 2)

While nature was not seen as acting intentionally, it was nevertheless seen as reacting to what is done to it and able to do damage as well. Humans, too, were seen as possessing apparently contradictory traits

Table 2. Statements with idealised Q sort positions (IQS), z-scores and assessment of consensus and distinguishing statements.

#	Statement	Factor 1		Factor 2		Factor 3		Consensus/ distinguishing
		IQS	z-score	IQS	z-score	IQS	z-score	
1	Humans are the most advanced product of nature	−1	−0.175	−1	−0.588	0	0.028	Consensus
2	Nature is powerful	1	0.606	4	1.441	4	1.921	F1
3	Environmental management should improve nature	0	0.159	0	−0.092	1	0.497	Consensus
4	Managing human affairs is more important than managing nature	−3	−1.345	−1	−0.640	−1	−0.586	F1
5	Humans are in control of nature	−3	−1.343	−3	−1.457	−2	−0.802	
6	Humans are guardians of nature	2	0.874	−1	−0.247	0	−0.384	F1
7	Humans are self-interested	1	0.680	0	−0.086	2	1.299	Distinguishes all
8	Humans only respond to authority	−2	−0.764	−2	−1.249	−1	−0.476	
9	Nature is far from humans	−3	−1.311	−3	−1.700	−1	−0.538	F3
10	Nature is not important	−4	−2.252	−4	−1.950	−4	−2.263	Consensus
11	Nature is sentient	−2	−0.705	3	1.242	1	0.594	Distinguishes all
12	Nature is sacred	−1	−0.466	3	1.259	−3	−1.236	Distinguishes all
13	Humans are a mix of good and bad	1	0.676	−1	−0.253	2	0.949	F2
14	Nature is a blind force	0	−0.119	−1	−0.588	−2	−0.621	Consensus
15	Nature is passive	−1	−0.355	−3	−1.285	−4	−1.606	F1
16	Humans are generous	0	−0.091	0	0.254	−2	−1.027	F3
17	Humans are too smart for their own good	0	0.123	−2	−0.647	0	−0.307	
18	Environmental management should maintain order	−1	−0.563	−2	−0.840	0	−0.188	
19	Humans are independent of nature	−3	−1.492	−4	−1.987	−3	−1.076	
20	Nature is everywhere	3	1.343	2	1.131	3	1.452	Consensus
21	Nature is generous	0	0.021	1	0.534	2	1.174	F3
22	Humans want to do good	1	0.307	0	0.222	−1	−0.469	F3
23	Nature is chaotic	−1	−0.309	0	−0.023	−2	−0.901	F3
24	Environmental management should minimise negative impacts of human activity	3	1.406	2	0.827	1	0.817	F1
25	Humans are cooperative	1	0.471	0	0.330	0	−0.224	
26	Environmental management should establish a reciprocal relationship with nature	1	0.696	1	0.720	1	0.733	Consensus
27	Nature is mysterious	1	0.192	1	0.813	1	0.447	
28	Environmental management should mean leaving nature alone	−1	−0.523	−1	−0.646	−3	−1.383	F3
29	Environmental management should primarily protect nature	2	0.931	1	0.460	0	−0.378	F3
30	Nature has intrinsic rights	3	1.202	3	1.263	−3	−1.375	F3
31	Nature is a collection of resources	−1	−0.433	1	0.345	1	0.216	F1
32	Environmental management should maximise the benefits for humans	−2	−1.169	−3	−1.409	−2	−0.719	
33	Humans are just one part of nature	3	1.281	2	0.999	2	1.188	Consensus
34	Nature is a self-regulating system	0	0.169	2	1.130	4	1.467	F1
35	Humans come from nature	2	0.766	4	1.508	1	0.741	F2
36	Humans are beneficiaries of nature's gifts	2	0.844	3	1.257	3	1.307	Consensus
37	Humans have a responsibility towards nature	4	1.793	2	1.126	4	1.453	
38	Nature is resilient	0	0.028	1	0.738	3	1.306	F1
39	Humans are a threat to nature	4	1.809	−1	−0.247	2	0.839	Distinguishes all
40	Environmental management should mean keeping humans safe from nature	−1	−0.691	−2	−0.926	0	−0.378	Consensus
41	Environmental management should mean taking care of nature	3	1.309	0	0.037	3	1.355	F2
42	Humans are outside of nature	−4	−1.743	−4	−1.766	−3	−1.111	F3
43	Nature controls humans	−2	−1.075	1	0.451	−1	−0.497	F2
44	Nature is hostile	−3	−1.413	−2	−0.821	−1	−0.390	F1
45	Environmental management should work with nature/nature's processes	4	1.486	4	1.329	2	0.824	
46	Nature is a divinity	−2	−0.969	1	0.560	−4	−1.809	Distinguishes all
47	Nature is fragile	2	0.769	−1	−0.206	3	1.306	F2
48	Environmental management should ensure that nature remains wild	1	0.454	0	−0.182	−1	−0.406	F1
49	Environmental management means having to negotiate with non-human beings	0	0.175	2	0.932	−2	−0.672	Distinguishes all
50	Humans know much less than we think	2	1.173	0	0.159	−1	−0.537	Distinguishes all
51	Humans are rational	−2	−0.726	−2	−1.118	0	0.035	F3
52	Nature is a threat	−4	−1.706	−3	−1.347	0	−0.259	F3
53	Nature is creative	0	−0.005	3	1.228	1	0.670	F1

such as at the same time being irrational, selfish, ignorant and therefore harmful to nature, but also generous and sometimes rational. At the same time, they were also seen as having the potential to be guardians of nature and having the responsibility to do so, which was both linked to having done damage and to being seen as the most advanced or successful species:

> I think we are past the tipping point when anybody other than us can sort out the problems. Well, there is nobody else but us. The animal kingdom can't. I don't believe the self-regulation of earth can…well,

I don't think it is going to rescue earth. It would have to be us and the action that we take to change things. Humans are guardians of nature, at our best we should be. We're poor guardians at the moment, but we should be. (Allotment 8)

However, while humans were seen as having some power and responsibility in relation to nature, there was also a sense that they were not in control and that outcomes of human actions may be different from what is intended, which for some of the participants was linked to insufficient knowledge. Some participants also emphasised systemic issues (often in the

form of economic structures or factors) as the root cause of environmental problems. This could make it difficult for individuals to do anything about environmental problems and could also lead to trade-offs and dilemmas:

> […] for people to prioritise nature, for that to become one of their primary considerations, the other threats to life have to be kind of lifted. So, where people are starving and their only priority is to feed themselves, and they don't care how they do it, you can cut down a forest and create it into farmland, and then in ten years, all the soil's gone or something like that, you know, […]. So you, you really need to have economic activity so that people's priorities aren't fundamental survival. And to do that, you do need to sacrifice a bit of natural world, to create an economy that works, unfortunately, unfortunately for the natural world. (Garden 5)

In terms of their own practices, all of the interviewees exemplifying this discourse tried to use practices which they saw as 'nature friendly' by for example planting particular species or putting in structures such as 'insect hotels' or ponds with the aim of enhancing biodiversity. For some participants, the idea of guardianship or responsibility could also be enacted by minimising their interventions (e.g. by employing no- or minimum-dig methods, not using pesticides and not killing 'nuisance' species such as slugs) rather than by doing specific things.

3.2. Discourse 2: partnership with powerful nature

Discourse 2 was associated with 5 Q sorts and explains 20% of the study variance. Q sorts from two organic farmers, one allotment holder and two gardeners, including a community garden, were associated significantly with it. This second discourse framed nature as powerful (S2:+4), and disagreed with the notion that nature is fragile (S47*:-1). It also agreed more strongly with the characterisation of nature as sacred (S12*:+3 and S46*:+1) and sentient (S11*:+3). This discourse emphasised that humans are part of nature (S35*:+4) and controlled by nature (S43*:+1). Accordingly, the role of environmental management was seen differently compared to the other discourses. There was less emphasis on humans taking care of nature (S41*:0) and more on working with nature (S45:+4) and having to negotiate with non-human beings (S49*:+2). In terms of how humans are framed, this discourse strongly disagreed with the ideas that humans are independent (S19:-4) and outside of nature (S42*:-4), and mildly disagreed with the fact that humans are a mix of good and bad (S13*:-1) while the other discourses agreed with this statement.

The findings from the quantitative analysis were supported by the qualitative analysis of the five interviews exemplifying this discourse. In contrast to the first discourse, nature was seen as powerful and resilient at least on some level:

> So nature is fragile, you know, if you crush a butterfly, it's fragile, but the bigger picture of the natural world is hugely resilient even with man in it because in the end, if humans kill themselves by polluting the planet and kill a lot of other things with it, there will be some nature that survives and it will just be a different form, so I don't know. (Farm 5)

This was also linked to seeing nature as more active and sentient compared to the first discourse:

> And yeah, I think it's a dangerous thing to [see nature as passive], […] it takes the sort of, the voice out. Which contradicts the whole things that I was most agreeing with about it being something that can be, you know, is explicit and is active and is telling us, showing us, telling us, things all the time. So yeah, in a way, it's the most toxic for actually having a reciprocal relationship is to see that it's passive and it has nothing to say. (Garden 3)

This view of nature also influenced how the interviewees saw their own role and that of humans more generally in relation to nature. The emphasis here was on working with nature, though this was experienced in different ways. For some, it was a matter of there being no choice due to the power of nature. For others, it was more of a matter of choice, of not wanting to be dominant, and establishing a more reciprocal relationship with nature:

> I: 'How do you see your own role in your garden?'
>
> R: 'A participant. [laughs] Something. I'm just doing a little bit and … the co-creators. … Maybe in the vegetable garden, I'm a bit more dominant, and the other bit, less. But, in a way, that's what I like, that I'm not the controller. Because that takes away the divine expression, what, what…, the amazement what actually comes up. […] It gives me so much joy to see, Oh, gosh, this plant has suddenly popped up here. [laughs] … and if I have it all under control, then … It's the chaos of it actually, in a way, I quite like'. (Garden 4)

Humans were seen as part of nature, and as complex beings that can be generous and self-interested, spiritual, rational and irrational. This was in many ways similar to the first discourse, but here there was more emphasis on the interconnections between all things and on humans as just one part of nature and not necessarily any more advanced than other parts:

> I see nature as being the natural world. So that's all the … , I consider that to be the basic resources that are available to us, I consider it to be the forces and the things that I suppose are summed up in the laws

of…er…the laws of physics I suppose and the fact that particles stick together and react with each other and all these sorts of things. All those sorts of things I consider to be part of nature and that is… and we are just a combination of all those things. And maybe we've got slightly more abilities in our brain than some other things, but at the end of the day nothing is any less amazing in how it works than anything else. How the hell does a tree stand up there when a building falls down in an earthquake, it always amazes me that. (Farm 2)

As with the previous discourse, some of the interviewees saw the causes of environmental damage as linked to bigger, systemic issues which could make it difficult for individuals to do anything about these problems:

I look at the way food is produced and it is so efficient and there is nothing in the fields for anything except people, and there's sprays to take the weeds away and the combines are so efficient, there's not one grain of barley or oats left. And then, you know, most of the farmers I understand entirely why they do it because of our policy system driving that, and the subsidies are all in the wrong place, and what we end up with is a highly efficient dead landscape. (Farm 5)

I think it's to do with hierarchy […] it's getting rid of oppression and 'you are better than me'. […] And it's the same with nature, if we think we're better than nature, we can, you know, have this power balance, power over nature instead of being equal partners. (Garden 4)

In terms of their own practices, these were often similar to those found amongst interviewees exemplifying the first discourse such as organic practices but with an emphasis on not interfering and allowing space for natural processes. An example was the adherence to no/minimal digging to not disturb the soil too much. This was often connected to the idea of balance. Observation and learning, in contrast to actively doing things, were also reflected upon:

I had so many ideas of things to do and I was like, 'Oh no, I'll wait before I do too much, just to see what's already here', and there were so many surprises. By waiting, that I got to see, 'Okay, this bit looks like there was nothing, but actually, there was loads of bluebells'. (Garden 3)

Respondents associated with this discourse also placed a strong focus on the role of soils and practices oriented to maintain soil quality, using rotations and managing the water flow to avoid soil losses:

I'm very aware that soil is my most valuable resource. So yeah, we never use anything on the soil that might harm the soil fauna, so all the microbes and earthworms and that obviously includes not spraying anything and it includes not

taking the tractor on ground that would crush the soil. (Farm 5)

3.3. Discourse 3: rational anthropocentric management

The Q sorts of 4 participants (one conventional farmer, one organic farmer and two allotment holders) were significantly associated with this factor. It explains 18% of the study variance. In this third discourse humans were more unequivocally seen as self-interested (S16*:-2 and S22*:-1) but also as more rational and knowledgeable (S51*:0 and S50*:-1) compared to the other discourses. Nature was seen as a self-regulating system (S34:+4) and not as chaotic (S23*:-2) and, as in discourse 2, nature was seen as powerful (S2:+4) and not as something passive (S15:-4). However, in contrast to discourse 2, nature was not seen as sacred or divine (S12*:-3 and S46*:-4) and not as something that needed to be negotiated with (S49*:-2) nor as having intrinsic rights (S30*:-3). In this discourse, nature, and not humans, was seen as generous (S21*:+2). The relationship between humans and nature was also seen slightly different compared to the other two discourse. This discourse disagreed less with statements suggesting that nature is far from humans (S9*:-1) and that humans are outside of nature (S42*:-3). Within this view, the role of environmental management was also seen somewhat differently: whereas the other two discourses tended to agree that environmental management should primarily protect nature, discourse 3 was neutral or mixed in this regard (S29*:0) and there was a tendency to disagree with the statement that nature should be left alone (S28*:-3). Instead, as in discourse 1, humans were seen to have a responsibility towards nature (S37:+4).

The qualitative analysis of the four interviews exemplifying this discourse further helped to understand and nuance this perspective and painted a picture of humans as part of a nature dominated by evolutionary forces where selfishness is rational and natural:

I think that environmental management, you're not negotiating with non-human beings, you're not negotiating at all because nature is the way it is and it's a culmination of a series of selfish, you know, self-interested survival instincts of a whole number of, you know, it's, it's, Darwin interacting … all of, all of nature is a lot of very selfish decisions that allows little spaces for lots of different things […] it's not like you could say, Ooh now, the hares, if you're very kind, would you please leave my cabbages alone, and I will give you a nice little bit over here? They're, like, No, I like your organic cabbages and I will be bloody eating them. (Farm 7)

As illustrated in the above quote this meant that nature was seen in terms of competition. At the

same time, it was seen as non-sentient and hence something to be managed rather than negotiated with. While nature was seen to provide many good things it was also seen as something that could be dangerous to humans and therefore at times needed to be managed.

As in the other discourses humans were seen to be part of nature and as complex beings, which were a mixture of good and bad. In contrast to the other two perspectives, there was an emphasis on the 'naturalness' of being selfish and the importance of being rational:

> We do things because it's in our interest to do it. And if it becomes not in our interest, then that's why you'll get situations where the environment isn't being looked after because people don't care [...] I mean, I think that must apply to all plants. They have an inherent self-interest. When something grows, it'll suppress the competition round about it because it's self-interested, it's built into the genes. So I think that follows that human beings are no different. (Allotment 3)

Similar to discourse 2, several of the interviewees exemplifying this perspective emphasised that humans are part of nature and that humans should therefore also actively intervene in nature either to avert danger or to derive benefits. This was also seen as a matter of balance where it was necessary to take care of nature and not overexploit it in order for humans to benefit:

> I've got some aquilegia that's just come in and it's just decided to grow in that particular spot, I will allow it to do that. There's a certain limit though how far, things like creeping buttercup. If I allowed it to do that it would just cover the entire area, so that's one where I'm not respecting it. But I think I would..., I am being a manager of my own space. [...] if we're going to use our land, we do have to put back into the soil and it's something that I tend to think is we're not respecting nature so much as more serving our self really. (Allotment 11)

As with the other two discourses, interviewees at times connected their own relations and practices to more structural issues:

> We've got to be self-interested in ourselves first and foremost and then if we've got anything left over, we will make sure that the environment's looked after. But if we're on the breadline, well, the last thing I'm going to do is to be concerned about the environment. We're thinking about putting food on the table here [...] It is a balance, and so ultimately if farming is profitable then I would say farmers would be, and generally are, excellent custodians of the countryside. (Farm 3)

The interviewees exemplifying this discourse employed a diversity of practices ranging from organic to use of pesticides. If there was a common thread it could be said to be rational or good management (in whatever way that was defined) and actively responding to any problems arising. Compared to the other discourses, production was often emphasised over other goals as well as the role of active management and 'manipulation' to achieve those goals.

> [...], if you're within the sort of ten to twenty percent range, you've got that loss, sustainable loss, that's a key element to me. Once it gets past twenty percent, and gets to the thirty percent, that's when you have to start doing something about it so [...] Love seeing the hares, great friends of mine, but if they mess with too much of my stuff, you have to prune. And it's the, it's a concept of pruning in order to get the best out of things. [...] That is very important is to apply just enough pressure to make something behave very well. (Farm 7)

The emphasis on production goals also meant a clearer distinction between the use of different spaces:

> Well, the thing is that a plot is an unnatural environment. What we're doing is we're disturbing what nature would do to focus on what we're doing, and my wife says to me why don't you put all these bee-friendly lacy phacelia plants in the garden. I said, because it's an allotment and it doesn't fit in with my plan. She says well, you're not looking after the bees at all. I said no, I've got another ..., this is not a wild garden, this is a plot. You cannot have them both in the one place. That's a dilemma for lots of people. (Allotment 3)

3.4. Shared themes and divergences across social perspectives

While the three discourses represented different understandings of humans, nature and the relationship between them, there was also overlap and similarities amongst the three perspectives. One of these cross-cutting themes was the notion of balance which cropped up in interviews across the three perspectives and which we have already in part touched upon above. Many of the interviewees thus talked about the need to find and maintain balance between humans and nature. This was the case in their own practices as well as on a larger scale. Nearly all interviewees agreed that human needs should be met but also that humans were currently taking more than their fair share of earth's resources. However, the main difference amongst the three perspectives seemed to be where and how this balance was to be found. This could for example be seen in differences in participants' views on ascribing rights to nature and whether parts of nature should or could be left unmanaged or wild.

In the interviewees' own practices, these differences were for example seen in the way in which they dealt with 'nuisance' plants and animals (e.g. birds, slugs and weeds) that were eating or competing

with food plants. While some emphasised sharing their crop with other species, others emphasised the need to protect their crops for example by putting up netting, 'pruning' hares, killing slugs or weeding. The same problem of finding balance was also seen to play out at larger scale. While some emphasised human nature as part of the larger problem (e.g. in the form of greed or selfishness), others pointed to systemic issues, often linked to economic forces, as the root cause of imbalance between humans and nature. Balance was also framed by some in terms of human wants versus what ecosystems are able to provide.

Another shared theme was learning, which came up in many interviews. This included learning how to care for soil and plants, and what plants could be successfully included in the assemblages that made up the respondents' growing space together with the soil, other plants, animals, weather, etc. It also included learning about environmental problems such as the decline of insect populations and climate change and letting this knowledge of more global problems inform their on-the-ground relations and practices. Interviewees learned from other people, books and magazines, as well as directly from experience. Learning was necessary to be able to grow things and to respond to problems and, as such, was seen as a responsibility by some. For others, learning and the 'getting to know' other-than-humans was an important part of the positive experience of growing plants and part of the relationship to the piece of land that they were tending, together with other more tangible benefits such as having fresh food or feeling that they were doing something for the environment even if only on a small scale (e.g. by planting flowers for insects or by reducing their food miles). Learning was not only connected to doing things but also to observing, listening and noticing what is happening.

With regard to the participants' own practices of growing plants, certain practices such as making and using compost were widespread amongst all participants regardless of which perspective their card sorting represented, while other practices such as 'minimum dig' were practised only by some participants but without being clearly linked to particular social perspectives. Perspectives differed to some extent in how control was seen as in relation to growing practices. While discourses 1 and 3 were more amenable to the idea that environmental management should maintain order and therefore practices ensuring that control and order were portrayed as necessary to care for and look after nature, discourse 2 placed more emphasis on practices of 'working with' that acknowledged the agency of other-than-humans.

4. Discussion

Our study showed the existence of three different perspectives on humans, nature and the relationship between them although there were also overlaps amongst them. The perspectives can be linked to wider discourses and ways of seeing the world. The third discourse thus most closely reflects views commonly assumed to dominate in western societies such as rationalism, competition and individualism (Plumwood 1993). This discourse also fits well with the relational model that Muradian and Pascual (2018) have called 'utilization'. Some elements of this mainstream western perspective could also be found in the other two discourses, such as nature not being sentient and humans being more advanced than other beings. At the same time, all the respondents saw humans as part of nature, something which goes against Cartesian dualism, which is often seen as the fundament of western societies. Other studies have likewise found that nature perceptions of members of western cultures did not always align those embedded in rationalist, Cartesian perspectives (Fisher and Young 2007). It is important to point out, though, that our respondents were selected because they were engaged in plant growing and thus in some way 'nature interested'. Several of the respondents commented that not everybody might see humans as part of nature and that nature might feel far away for many people.

4.1. Links between human-nature conceptualisations and practices

The different ways of conceptualising nature and humans and the relations between them led interviewees to see the role of humans differently within the three perspectives. In the first discourse, humans were seen as the most advanced part of nature, but also as having upset the balance of a fragile nature due to greed and ignorance and therefore as being responsible for restoring balance. In contrast, the second discourse, portrays nature as powerful and humans as just one (small) part of it. On the one hand, this meant that there was more emphasis on listening and 'working with' while on the other hand, there was less emphasis on the importance of environmental management. Finally, in the third discourse, humans (and nature in general) were seen as 'rationally selfish' which ideally would lead to balance under the right conditions. The different discourses thus implied different ways of approaching environmental issues and the right way for humans to relate to nature. Such differences in perspectives can also be found across different ways of 'doing' conservation such as when considering stewardship (Raymond et al. 2016), rewilding (Holmes et al. 2019) or

payment for ecosystem services (Martin-Ortega and Waylen 2018) and their normative implications.

Though the different discourses implied different preferences and views on how environmental issues should be approached, the study also showed that the respondents' own practices did not neatly map on to abstract perspectives. Overlaps and differences in practices across discourses should not come as a surprise given that relations always reflect the specificities of the context and the particular human and other-than-human beings involved in them (Chan et al. 2016) while the discourses identified by the quantitative analysis reflected more abstract values and considerations. Furthermore, people can hold different interpretations of what it means to act in accordance with particular values or what it means to care for something and to do it well.

4.2. The role of learning

The dynamic nature of relations also came to the fore in frequent mentions of learning as an important part of growing plants. Studies on care have emphasised the importance of being attentive and learning as part of being able to care well for others (Chapman and Desplazes-Zemp 2023). To care for another thus requires an understanding of the needs of the other and how these needs can be met (Tronto 1993). Some of the participants thus emphasised the importance of their own learning journeys which enabled them to become skilful care takers of plants, soils and other beings. Differences remained, however, in terms of the aim and extent of this care. For some, the learning and the care were focused on dealing with problems such as weeds and pests and optimising conditions for desired plants, while for others the care was more focused on not doing harm, allowing space for other-than-humans or finding the right balance between their own needs and those of others. For some, there was also an element of joy in learning for its own sake and as part of getting to know the many different members and processes that made up the evolving relations between growers and their growing spaces.

The different aims and perceptions of care and learning were also linked to differences in how power was conceived and played out in growing spaces. This was reflected in the placement of statements such as 'Humans are in control of nature', 'Nature controls humans' and 'Environmental management means having to negotiate with non-human beings' (see idealised Q sorts positions in Table 2). Participants who aligned with discourse 3 thus placed more emphasis on actively controlling and intervening in order to further their own aims and interests compared to interviewees aligned with discourse 2 who were more likely to see their role as partners

and participants negotiating with other-than-humans in order to find a balance between different interests and needs. In this sense, discourse 3 is more closely aligned with the kind of Cartesian rationalism that has been so influential in western mainstream societies. This was also seen in the emphasis on the naturalness of selfishness and competition in discourse 3. In contrast, discourse 2 seems more closely aligned with some aspects of indigenous worldviews such as in understanding humans as part of nature, and seeing nature as sacred and sentient (e.g. Salmon 2000; Kealiikanakaoleohaililani and Giardina 2016; Mazzocchi 2020).

The different ways in which relations can be understood and power is enacted within them suggests that promoting 'relational values' is not sufficient to ensure more sustainable or less exploitative ways of living and relating (Hoelle et al. 2022; Pungas 2022). This was also reflected in interviewees recounting their own sense of powerlessness in the face of wider systemic issues such as economic structures and governance systems. Using a relational lens can, however, help to widen the field of who and what are considered as active participants in the first place. Nevertheless, this needs to be combined with other perspectives that explicitly address issues of power and inequality. A useful perspective is that offered by care studies. Perceptions of needs and how to meet these needs in adequate ways often differ between those receiving, giving and making decisions about care. To provide good care, it is therefore necessary to take into account these power differences and for care givers and decision makers be attentive to care receivers and to ensure their voices are heard. This is true whether the care focuses on humans or other-than-humans (Puig de la Bellacasa 2017).

4.3. Contradictions and paradoxes in human-nature relations

Another important point that came up were the contradictions and paradoxes that interviewees perceived in how they sorted the statements, how they acted and how they viewed the world. This is illustrated by participants reflections on how nature, as well as humans, were seen to hold apparently contradictory traits (see discourse 2 description); and by some participants noticing contradictions between the values expressed through the Q sorting process and their actual practices on the ground (e.g. caring about biodiversity while adopting practices not considered biodiversity friendly such as using herbicides). This is in line with other studies showing that people hold multiple human-nature relationships (Brodt et al. 2006; Braito et al. 2017). Seemingly contradictory viewpoints can easily be held at the same time (Flint

et al. 2013; Steg et al. 2014) such as nature being both powerful and fragile, and humans being selfish and wanting to do good. Rather than representing careless card sorting the interviewees' comments showed that this reflected an acknowledgement of the complexities and paradoxes they encountered in the world. In contrast, many governance approaches to environmental problems are based on more purist assumptions about consistency in human motivations, values, behaviours and nature ignoring the commonplace occurrence of contradictory decisions and practices (Fischer and Marshall 2010; Brown et al. 2021).

The paradoxes encountered by the interviewees reflect tensions as an inherent aspect of relations. Tensions can arise due to contradictory desires and a fundamental unknowability of others and ourselves (Turnaturi 2007; Weber 2019). Paradoxes and conflicts were thus not only experienced on a theoretical, abstract level when thinking about human-nature relations, but also played themselves out in interviewees' practices and lives. For some this was experienced as conflict between personal values such as wanting to be 'green' but still depending on fossil fuels to uphold transport and consumption habits. For others, it was experienced as a dilemma or frustration arising on the one hand from a sense of personal responsibility and wish to act while on the other hand feeling that the influence of higher level, structural factors rendered personal actions ineffective. In this context, growing and tending plants became a way of acting and having an impact at the micro level that felt meaningful even while acknowledging that it did not make any difference in terms of larger environmental problems such as climate change and biodiversity loss. At the same time, tensions and contradiction also had to be faced as part of growing practices when for example deciding how much to intervene and control and how to balance one's own desires (e.g. for food and aesthetics) with the desires of other-than-human beings that were co-inhabiting and co-creating the same space.

gParadoxes are thus an inherent part of growing plants, especially when this is seen as a way to connect to nature. Gardens, allotments and farms are per definition spaces that humans seek to exert control over, including and excluding species based on human preferences and goals. In some cases, this fits well with participants' view of nature and human-nature relationship (humans should control nature), but in others it does create dilemmas when they want to have more equitable relationships but find that they still need to kill or control other beings to produce food. This ultimately relates to the question of balance that came up in all perspectives identified in this study: how do we find the right balance between our (human) interests and those of others?

In this respect, our study adds to the literature on values as well as practices by showing the importance of linking abstract concepts or values to how they are enacted and play out in specific relations. Sticking with the abstract can easily lead to seeing perspectives, values and relations as fixed, following pre-determined schemata. Bringing in a relational understanding helps to see relations as processes that are always potentially changing and co-produced as the constellations and perspectives of involved human and other-than-human beings change (Darnhofer 2020). In contrast, most policies about environmental issues act on the basis of abstract notions and values and aim for the uniform application of particular practices regardless of specific embodied relations and contexts (Allen et al. 2018).

5. Conclusions

This study explored people's relations with plants, animals, soils and other beings in the context of growing plants. We identified three discourses bringing together abstract values and perceptions about humans and nature and their implications in terms of three different relational models, namely 'guardianship of fragile nature'; 'partnership with powerful nature'; and 'rational anthropocentric management'. The discourses implied different ways of relating to nature and finding the right balance between human needs and those of others, but also included contradictions and tensions, with individuals often drawing on elements of different discourses. Similarly, practices did not neatly map onto particular discourses, with different discourses leading to similar practices and different practices sometimes observed within the same discourse. These overlaps and contradictions often reflected specificities of the context, as well as different interpretations of what it means to enact particular abstract values and considerations. Within all these discourses, however a central aim of many growers was to find a balance between the perceived needs of other-than-humans and human goals. Another cross-cutting theme was learning, which was an important part of growing plants together with more material and other non-material benefits. This reflects the mix of motivations and experienced benefits shaping the relationship to the garden, plot or farm.

Our study also shows the keenly felt limitations of emphasising both values and individual actions to address environmental issues such as the biodiversity and climate crises. While values are part of how we relate to humans and other-than-humans, our study shows how systemic and structural issues such as those related to current economic structures and governance systems, can make it difficult for people to act on their (plural) values and cultivate more benign relations with other-than-humans.

While policies related to environmental issues often build on worldviews and values related to Cartesian dualism, rationalism and utilitarian thinking (Muradian and Gomez-Baggethun 2021), the research

showed the importance of other values. Growing spaces are spaces where people and values develop through relationships with others. They are also spaces where values conflict, complexity and paradoxes are encountered as a result of these relationships to nature/other-than-humans. Acknowledging this plurality of perspectives, as well as their contradictions, overlaps and tensions, can open up space for alternative narratives to be reflected in policies and, in consequence, for policies to promote other types of behaviours and ways of being. A focus on human-nature relationships allows a better understanding of the drivers and behaviours underlying environmental decisions and change (Muradian and Pascual 2018). Representing value plurality in policies requires however, methods that enable different human-nature relationships to be recognised. Participatory, deliberative approaches (Isacs et al. 2023) and performance-based approaches (Olvera-Hernandez et al. 2023) are possible avenues to facilitate the integration of value plurality within policy designs.

Notes

1. In the following we generally use the term 'other-than-human' instead of nature to avoid some of the values and (multiple) meanings embedded in the term 'nature' When speaking with our participants we generally used the term 'nature' due to its more commonplace occurrence and that the multiple meanings were in part what we were interested in investigating.
2. The online interviews were done on Skype or Microsoft Teams and the researcher shared their screen showing the list of statements and the Q grid displayed in Microsoft Office PowerPoint. The participant then directed the researcher as to how to organise the statements on the virtual grid.

Acknowledgements

Disclosure statement

Paula Novo is one of the Special Issues Editor, but is not involved in the peer review and decision making process regarding this manuscript.

Funding

ORCID

Paula Novo http://orcid.org/0000-0002-5635-3636
Anja Byg http://orcid.org/0000-0001-9311-9526
Scott Herrett http://orcid.org/0000-0001-6409-6986

References

Allen KE, Quinn CE, English C, Quinn JE. 2018. Relational values in agroecosystem governance. Curr Opin Sust. 35:108–115. doi: 10.1016/j.cosust.2018.10.026.

Armstrong K. 2022. Sacred nature: how we can recover our bond with the natural world. London (NY): Bodley Head.

Bain P, Vaes J, Kashima Y, Haslam N, Guan Y. 2012. Folk conceptions of humanness: beliefs about distinctive and core human characteristics in Australia, Italy, and China. J Cross Cult Psychol. 43(1):53–58. doi: 10.1177/0022022111419029.

Braito MT, Böck K, Flint C, Muhar A, Muhar S, Penker M. 2017. Human-nature relationships and linkages to environmental behaviour. Environ Values. 26(3):365–389. doi: 10.3197/096327117X14913285800706.

Brodt S, Klonsky K, Tourte L. 2006. Farmer goals and management styles: implications for advancing biologically based agriculture. Agric Syst. 89(1):90–105. doi: 10.1016/j.agsy.2005.08.005.

Brown C, Kovács E, Herzon I, Villamayor-Tomas S, Albizua A, Galanaki A, Grammatikopoulou I, McCracken D, Olsson JA, Zinngrebe Y. 2021. Simplistic understandings of farmer motivations could undermine the environmental potential of the common agricultural policy. Land Use Policy. 101:105136. doi: 10.1016/j.landusepol.2020.105136.

Buijs AE, Fischer A, Rink D, Young JC. 2008. Looking beyond superficial knowledge gaps: understanding public representations of biodiversity. Int J Biodivers Sci Manage. 4(2):65–80. doi: 10.3843/Biodiv.4.2:1.

Chan KMA, Balvanera P, Benessaiah K, Chapman M, Díaz S, Gómez-Baggethun E, Gould R, Hannahs N, Jax K, Klain S, et al. 2016. Why protect nature? Rethinking values and the environment. Proc Natl Acad Sci USA. 113(6):1462–1465. doi: 10.1073/pnas.1525002113.

Chan KMA, Gould RK, Pascual U. 2018. Editorial overview: relational values: what are they, and what's the fuss about? Curr Opin Sust. 35:A1–A7. doi: 10.1016/j.cosust.2018.11.003.

Chapman M, Desplazes-Zemp A. 2023. 'I owe it to the animals': the bidirectionality of Swiss alpine farmers' relational values. People Nat. 5(1):147–161. doi: 10.1002/pan3.10415.

Country B, Wrigth S, Suchet-Pearson S, Lloyd K, Burarrwanga L, Ganambarr R, Ganambarr-Stubbs M, Ganambarr B, Maymuru D, Sweeney J. 2016. Co-becoming Bawaka: towards a relational understanding of place/space. Prog Hum Geogr. 40(4):455–475. doi: 10.1177/0309132515589437.

Darnhofer K. 2020. Farming from a process-relational perspective: making openings for change visible. Sociol Ruralis. 60(2):505–528. doi: 10.1111/soru.12294.

Dasgupta P. 2021. The Economics of Biodiversity: the Dasgupta Review. London: HM Treasury.

De la Cadena M. 2015. Earth beings: ecologies of practice across Andean worlds. Durham (NC): Duke University Press.

Fischer A. 2010. On the role of ideas of human nature in shaping attitudes towards environmental governance. Hum Ecol. 38(1):123–135. doi: 10.1007/s10745-009-9281-y.

Fischer A, Marshall K. 2010. Framing the landscape: Discourses of woodland restoration and moorland management in Scotland. J Rural Stud. 26(2):185–193. doi: 10.1016/j.jrurstud.2009.09.004.

Fisher A, Young JC. 2007. Understanding mental constructs of biodiversity: implications for biodiversity management and conservation. Biol Conserv. 136 (2):271–282. doi: 10.1016/j.biocon.2006.11.024.

Flint CG, Kunze I, Muhar A, Yoshida Y, Penker M. 2013. Exploring empirical typologies of human–nature relationships and linkages to the ecosystem services concept. Landsc Urban Plan. 120:208–217. doi: 10.1016/j.landurbplan.2013.09.002.

García-Antúnez O, Lindgaard JL, Olafsson AS, Stahl Olafsson A. 2023. Gardening for wildlife: a mixed-methods exploration of the factors underlying engagement in wildlife-friendly gardening. People Nat. 5(2):808–825. doi: 10.1002/pan3.10450.

Gould RK, Merrylees E, Hackenburg D, Marchina T. 2023. "My place in the grand scheme of things": perspective from nature and sustainability science. Sustain Sci. 18 (4):1755–1771. doi: 10.1007/s11625-023-01339-8.

Hall M. 2011. Plants as persons - a philosophical botany. Albany (USA): State University of New York Press.

Harvey M. 2005. Animism - respecting the living world. London, (UK): Hurst & Company.

Hertz T, Mancilla-Garcia M, Schlüter M, Muraca B. 2020. From nouns to verbs: how process ontologies enhance our understanding of social-ecological systems understood as complex adaptive systems. People Nat. 2 (2):328–338. doi: 10.1002/pan3.10079.

Hoelle J, Gould RK, Tauro A. 2022. Beyond 'desirable' values: expanding relational values research to reflect the diversity of human–nature relationships. People Nat. 5(6):1–12. doi: 10.1002/pan3.10316.

Holmes G, Marriott K, Briggs C, Wynne-Jones S. 2019. What is rewilding, how should it be done, and why? A Q-method study of the views held by European rewilding advocates. Conserv Soc. 18(2):77–88. doi: 10.4103/cs.cs_19_14.

Isacs L, Kenter JO, Wetterstrand H, Katzeff C. 2023. What does value pluralism mean in practice? An empirical demonstration from a deliberative valuation. People Nat. 5(2):384–402. doi: 10.1002/pan3.10324.

Kealiikanakaoleohaililani K, Giardina CP. 2016. Embracing the sacred: an indigenous framework for tomorrow's sustainability science. Sustainability Sci. 11(1):57–67. doi: 10.1007/s11625-015-0343-3.

Kenter JO, Raymond CM, van Riper CJ, Azzopardi E, Brear MR, Calcagni F, Christie I, Christie M, Fordham A, Gould RK, et al. 2019. Loving the mess: navigating diversity and conflict in social values for sustainability. Sustain Sci. 14(5):1439–1461. doi: 10.1007/s11625-019-00726-4.

Mancilla García M, Hertz T, Schlüter M. 2020. Towards a process epistemology for the analysis of social-ecological systems. Environ Values. 29(2):221–239. doi: 10.3197/096327119X15579936382608.

Martin-Ortega J, Waylen KA. 2018. PES what a mess? An analysis of the position of environmental professionals in the conceptual debate on payments for ecosystem services. Ecol Econ. 154:218–237. doi: 10.1016/j.ecolecon.2018.08.001.

Mazzocchi F. 2020. A deeper meaning of sustainability: insights from indigenous knowledge. Anthropocene Rev. 7(1):77–93. doi: 10.1177/2053019619898888.

Muradian R, Gomez-Baggethun E. 2021. Beyond ecosystem services and nature's contributions: is it time to leave utilitarian environmentalism behind? Ecol Econ. 185:107038. doi: 10.1016/j.ecolecon.2021.107038.

Muradian R, Pascual U. 2018. A typology of elementary forms of human-nature relations: a contribution to the valuation debate. Curr Opin Sust. 35:8–14. doi: 10.1016/j.cosust.2018.10.014.

Olvera-Hernandez S, Martin-Ortega J, Mesa-Jurado MA, Novo P, Holmes G, Borchi A, Walsh A. 2023. Can theatre be used in environmental governance? The view of environmental professionals in Mexico. Environ Sci Policy. 149:103559. doi: 10.1016/j.envsci.2023.103559.

Plumwood V. 1993. Feminism and the mastery of nature. London, (UK): Routledge.

Puig de la Bellacasa M. 2017. Matters of care. Minneapolis (USA): University of Minnesota Press.

Pungas L. 2022. Who stewards whom? A paradox spectrum of human–nature relationships of Estonian dacha gardeners, innovation. Eur J Social Sci Res. 35(3):420–444. doi: 10.1080/13511610.2022.2095990.

Raymond CM, Bieling C, Fagerholm N, Martin-Lopez B, Plieninger T. 2016. The farmer as a landscape steward: comparing local understandings of landscape stewardship, landscape values, and land management actions. AMBIO. 45 (2):173–184. doi: 10.1007/s13280-015-0694-0.

Roundtree K. 2012. Neo-paganism, animism, and kinship with nature. J Contemp Religion. 27(2):305–320. doi: 10.1080/13537903.2012.675746.

Salmon E. 2000. Kincentric ecology: indigenous perceptions of the human-nature relationship. Ecol Appl. 10 (5):1327–1332. doi: 10.1890/1051-0761(2000)010[1327:KEIPOT]2.0.CO;2.

Steg L, Bolderdijk JW, Keizer K, Perlaviciute G. 2014. An integrated framework for encouraging pro-environmental behaviour: the role of values, situational factors and goals. J Environ Psychol. 38:104–115. doi: 10.1016/j.jenvp.2014.01.002.

Tronto JC. 1993. Moral boundaries - a political argument for an ethic of care. London, (UK): Routledge.

Turnaturi G. 2007. Betrayals – the unpredictability of human relations. Chicago (USA): University of Chicago Press.

Vining J, Merrick MS, Price EA. 2008. The distinction between humans and nature: human perceptions of connectedness to nature and elements of the natural and unnatural. Res Hum Ecol. 15:1–11.

Watts S, Stenner P. 2012. Doing Q methodological research: theory, methods & interpretation. London, (UK): Sage.

Weber A. 2019. Enlivenment: toward a poetics for the anthropocene. Cambridge (USA): MIT Press.

West S, Beilin R, Wagenaar H, Watkins C. 2019. Introducing a practice perspective on monitoring for adaptive management. People Nat. 1(3):387–405. doi: 10.1002/pan3.10033.

West S, Haider LJ, Stalhammar S, Woroniecki S. 2020. A relational turn for sustainability science? Relational thinking, leverage points and transformations. Ecosyst People. 16(1):304–325. doi: 10.1080/26395916.2020.1814417.

Zabala A. 2014. qmethod: a package to explore human perspectives using Q methodology. R J. 6(2):163–173. https://journal.r-project.org/archive/2014-2/zabala.pdf.