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Exploring the prioritisation of biodiversity amongst small- to medium-sized enterprise leaders with strong bigger-than-self value orientation

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Abstract

This paper reports on a quantitative study of prioritisation of biodiversity amongst small- to medium-sized enterprise (SME) leaders. Existing research indicates that value orientation impacts propensity for pro-environmental behaviours. However, as biodiversity loss remains inadequately addressed, this study employs the value-belief-norm framework to explore how leaders with strong biospheric and altruistic (collectively termed 'bigger-than-self') value orientations perceive their responsibility for biodiversity loss in comparison with climate change and, using an adaptation of the Global Reporting Initiative standards, how biodiversity is prioritised against other areas of environmental sustainability in their businesses. Surveying 61 SME leaders, primarily in the South-West UK, it was found that biodiversity is often considered of low priority compared with factors such as energy, waste, materials and emissions. Analysis also indicates that these leaders feel less responsibility for biodiversity than for climate change demonstrating that, even where bigger-than-self values dominate, there is a need for higher prioritisation of biodiversity amongst SMEs.

KEYWORDS
biodiversity, biospheric, prioritisation, SME leaders, values

1 | INTRODUCTION

The need to address biodiversity loss is increasingly urgent, including the necessity for action across the entire business community. This research seeks to understand whether biodiversity is recognised and prioritised by small- to medium-sized enterprise (SME) leaders compared with other factors in environmental sustainability and how these leaders' perceptions of responsibility for biodiversity relate to those for climate change. The study focused on SME leaders with strong 'bigger-than-self' value orientation, a term collectively describing strong biospheric values (focused on benefitting nature and the environment) and altruistic values (focused on benefitting other people and society). Leaders with strong 'bigger-than-self' value orientation were demonstrated in previous studies to be more likely to act pro-environmentally than those with egoistic value orientation (focused on personal gain).

Abbreviations: AC, awareness of consequences; AR, ascription of responsibility; CA, Cronbach's alpha; CBD, Convention on Biological Diversity; CEO, Chief Executive Officer; EC, European Commission; EMAS, Eco-Management and Audit Scheme; GDP, gross domestic product; GHG, greenhouse gas; GRI, Global Reporting Initiative; IEMA, Institute of Environmental Management and Assessment; IPBES, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services; IPCC, Intergovernmental Panel on Climate Change; ISO, International Organization for Standardization; NEP, new environmental paradigm; OECD, Organisation for Economic Co-operation and Development; SBTN, Science-based Targets Network; SME, small- to medium-sized enterprise; UNCC, United Nations Climate Change; VBN, value-belief-norm; WEF, World Economic Forum.

1.1 | Biodiversity loss is an urgent, and under-addressed, issue for humanity

For the first time in planetary history, human impacts have become amongst the most significant drivers of planetary change (Ellis, 2019; Laurence, 2019; Waters et al., 2016). An increasing body of research observes that we are at a critical point at which humanity risks permanently altering the planet's continuing capacities to sustain life in its present form (Goreau & Hayes, 2021; Ritchie et al., 2021). Four of the 'planetary boundaries' for human survival identified by Rockström et al. (2009) have already been surpassed, including those identified for biodiversity loss and climate change. A growing body of research warns that humanity is dramatically increasing the rate of biodiversity loss (Dasgupta, 2021; Dobson et al., 2021; Mantyka-Pringle et al., 2015) including estimates that 20% of species could go extinct within coming decades, potentially reaching as much as 40% by 2100 (Dasgupta, 2021). Populations of insect species, many of which humanity relies upon for food production (Ritchie, 2021; Van der Sluijs & Vaage, 2016), are estimated to have declined globally by as much as 75% in the past 30 years alone (Hallmann et al., 2017; Leather, 2017). In addition to direct impacts on human food chains and well-being (Schmeller et al., 2020), the cost to the global economy of nature degradation is huge. An estimated $44 trillion (half of global GDP) is threatened by loss of nature (WEF, 2020) presenting a compelling business case for the protection of the natural world, albeit that existential risks are inherently incommensurable with meaningful monetisation.

Changes in the global climate have a direct impact on biodiversity, and vice versa (Bellard et al., 2012; Folkard-Tapp et al., 2021; Kabisch et al., 2016), such that loss or degradation of habitats and species increases the likelihood of climate instability. This type of synergistic relationship demonstrates the complexity of achieving environmental sustainability and the need for systems-thinking approaches to resolve these crises (Palmberg et al., 2017; Williams et al., 2017). Climate change has been gaining global political and media attention and is increasingly recognised by business leaders as a threat requiring urgent responses. The target of ensuring that the planet does not cross a 1.5°C warming threshold by 2030 is repeatedly reiterated (Abnett, 2021; IPCC, 2018; UNCC, 2020). However, despite growing recognition and declarations of a 'biodiversity crisis' (Valentí, 2022), biodiversity loss targets are much less well-publicised. It is estimated that between 11% and 16% of biodiversity loss can be attributed to climate change, the rest coming from unfavourable use of land and sea, over-exploitation, pollution and introduction of invasive species (WEF, 2020, p. 8). Land-use changes have had the greatest overall negative impact on biodiversity globally since 1970: where and how food is produced comprising one of the largest determinants of land-use change and with fishing exerting the greatest impact in marine environments (IPBES, 2019). Therefore, solutions implemented to address climate change can not automatically be assumed to address the biodiversity crisis.

Despite clear evidence of its urgency, very little progress has been made in halting and reversing biodiversity loss. Species extinction rates are still accelerating (IPBES, 2019; UN, 2019). Of the 20 Aichi Biodiversity Targets set in 2010 by signatory Governments under the Convention on Biological Diversity (CBD) to arrest the loss of biodiversity by 2020, none were reached (Vaughan, 2020). In the UK, one of the most biodiversity-depleted regions in the world (Davis, 2020; Environmental Audit Committee, 2021; Goulson, 2021), 300 local authorities have declared a climate emergency (Climate Emergency UK, 2021) but only 22 had declared an ecological emergency (Grant, 2021). Grant (2021) found no evidence of any local authorities specifically declaring a biodiversity emergency. This demonstrates a clear need to understand where more successful actions can be taken to address biodiversity loss and who the key actors are in implementing these.

1.2 | Business activities are substantially responsible

Businesses have become the primary means by which society converts natural and other resources into useful products (Everard, 2000). For this reason, business activities are one of the principal causes of biodiversity loss (Dasgupta, 2021; Smith et al., 2020; WEF, 2019). Good business strategy is key for building the values of biodiversity into production as well as consumption decisions (Bradley et al., 2020). However, corporations still substantially fail to account for their impact on biodiversity in the face of accelerating extinctions (Jones & Solomon, 2013; KPMG, 2020) though Adler et al. (2017) reported some improvement. Many businesses are under-delivering against their stated sustainability targets (Johnson & Schaltegger, 2016; Weber et al., 2014), and many overclaim their achievements against sustainability goals; both of these factors inhibit genuine progress (Ihlen & Roper, 2014).

Businesses still struggle to incorporate protection and restoration of biodiversity into their daily operations (Van den Burg & Bogaardt, 2014); even enterprises with substantial resource and high-level accountability, such as fortune 500 companies, fall short of addressing biodiversity in their strategies (Addison et al., 2018). SMEs in particular seem to experience a number of barriers to acting pro-environmentally (Caldera et al., 2019). Yet most businesses in many countries are SMEs (Cassells & Lewis, 2011). For example, 99% of all businesses in Europe are SMEs (European Commission [EC], 2012) including in the UK (Hutton & Ward, 2021). The cumulative impact of SMEs on the environment is substantial (Revell et al., 2010), including an estimated 60%–70% of total pollution (Hillary, 2004; Nordic Council of Ministers, 2005; OECD, 2007). In the UK context, over half (64.4%) of all commercial and industrial waste is generated by SMEs (Woodward, 2015). Thus, the activities of SMEs are a key factor in addressing the biodiversity crisis.

Business leadership that recognises and prioritises biodiversity, and that takes responsibility in minimising negative impacts upon and increasing benefits to biodiversity from business activity, can be central to transforming the economy to pro-biodiversity production and consumption, reversing the trend of biodiversity loss. Anthony and

Morrison-Saunders (2022) conducted a quantitative study of biodiversity values conveyed by 40 large corporations, finding that strong anthropocentric perspectives on economic contribution dominated decisions with the protection of biodiversity only considered important where it held material benefit to humans. Williams and Schaefer's (2013) qualitative study found that, whilst economic arguments and external pressure played a role in pro-environmental engagement, the most notable motivation for SME managers of environmentally proactive small businesses were personal values and beliefs.

2 | LITERATURE EXPLORING VALUES AND PRO-ENVIRONMENTAL ACTION IN SME LEADERS

Values—ongoing, normative beliefs about appropriate standards of action and aspirational results (Nystrom, 1990; Rokeach, 1979)—are critical in determining behaviours (Bardi & Schwartz, 2003; Lönnqvist et al., 2013; Oceja et al., 2019). Stern (2000) demonstrated that biospheric value orientation (where people consider the environment and planetary well-being of highest importance) leads to a higher level of environmental concern, which may lead in turn to increased pro-environmental behaviours. De Groot and Steg (2008) demonstrated that those who tend more toward altruistic values (who place most importance on societal needs and other people) are more motivated by the benefits to other people of their sustainability-related actions. Both biospheric and altruistic value orientations focus on the importance of things beyond personal gain and are referred to collectively as 'bigger than self' value orientations within this study.

Conversely, people with strong egoistic value orientation primarily consider how they will personally benefit and are only likely to act pro-environmentally when the perceived individual benefits outweigh the perceived costs. Following De Groot and Steg's work, numerous other studies have emerged verifying this relationship between values and pro-environmental behaviour (Corner et al., 2014; Crompton et al., 2010), including studies that focus specifically on how leadership values impact pro-environmental behaviours in a business context (Lu et al., 2020; Uddin et al., 2021). Fritzsche and Oz (2007), for example, identified that altruistic values have a positive relationship with managers' ethical decision-making; conversely, egoistic values are negatively related to ethical decision-making.

It could be assumed that this connection between bigger-than-self values and pro-environmental behaviour would apply to biodiversity. However, previous studies in this area have focused largely on aspects of environmental sustainability connected to the climate change narrative, creating an important gap in the research. Steg et al. (2005), for example, looked at people's acceptance of energy use policies; Tolppanen and Kang (2021) explored how values relate to low-carbon lifestyles; and Unsworth et al. (2013) consistently referenced travel and energy use as their examples of pro-environmental behaviour. A study by Fornara et al. (2020) has begun to address this important gap, exploring the relationship between values and behaviours relating specifically to biodiversity and nature conservation. The study found that the value-belief-norm (VBN) chain, discussed in more detail in the methodology of this paper, predicted positive behaviours towards biodiversity and nature conservation from those with biospheric value orientation. However, a practical limitation of the study was that it focused on the behaviours of environmental activists, not those of business leaders.

Within this literature review, no studies were found to have tested the perceived importance and prioritisation of biodiversity amongst SME leaders with bigger-than-self value orientation and perceptions of corporate responsibility in addressing it. To develop this field of knowledge, there is a need for further exploration of the values of business leaders and their connection with action on biodiversity. This study therefore investigates whether SME leaders with strong biospheric and altruistic value orientation (bigger-than-self values) are prioritising biodiversity within their businesses. Our proposition was that this group of SME leaders would be prioritising and taking responsibility for biodiversity. This constituency also provided a manageable focus for the limited resources available to conduct the research. The following research question is explored:

> Are leaders of sustainability-focused SMEs, who have bigger-than-self values and high levels of environmental concern, recognising and prioritising biodiversity?

To investigate this, the study measured perceived importance and prioritisation of biodiversity by leaders of SMEs found to have relatively strong bigger-than-self values, and who claim to prioritise environmental sustainability.

3 | METHOD

A number of approaches were considered for exploring the value orientation of SME leaders. The well-established Schwartz Value Survey (Schwartz, 1992) and the more recently validated Environmental Portrait Value Questionnaire (Bauman et al., 2018) both provide a robust means to measure value orientation, but not action on values or changes in behaviour. The VBN theory (Stern, 2000) is widely applied in many studies and provides a useful and well-established framework for determining the connection between value sets, beliefs and behaviours. De Groot & Steg's (2009) study validated the VBN framework in research demonstrating that people with strong biospheric values are more likely to act pro-environmentally.

Due to its widespread use and application and validation and acceptance in this type of research, the VBN framework was applied to understand value orientation and level of environmental concern of those in a leadership role within SMEs, thus determining the likelihood of pro-environmental behaviour. This was correlated with determination of the degree to which biodiversity is prioritised by these leaders within their business, using an adaptation of the Global Reporting Initiative standards (Global Reporting Initiative, 2022).

Questions relevant to the VBN framework and determination of prioritisation given to biodiversity were consolidated into an online

survey. The survey was promoted via email and through LinkedIn to self-selecting, pro-sustainability SME leaders through a number of sustainable business networks of which the research team was aware and had access to

- The Institute of Environmental Management and Assessment (IEMA)—a strongly environmentally-focused business network;
- The Future Leap Network (https://futureleap.co.uk/network/), a UK-based membership organisation for sustainable businesses that covers a broader perspective on sustainability;
- Delegates of the Sustainable Business Festival 2021 which focused on a number of sustainability topics including biodiversity in a business context.

Because the investigation was exploring the personal values of leaders in line with their organisation's approach to sustainability, the population of interest was those with enough influence to determine business-wide direction and decisions—a degree of seniority that allows them to influence over the strategic direction of the business and over the wider body of employees. Therefore, those holding a role of Founder, Owner, CEO, Managing Director or an equivalent Senior Leadership role were invited to participate in the study as leaders.

All contributors were given the option of withdrawing from the study at any time. Collected data were stored on password-protected computer systems, and only summary data are used in this report without attribution to respondents. The survey was conducted anonymously for data protection and to encourage honesty. Participants were informed that the research was exploring the values of business leaders in relation to sustainability, but not that the study was interested specifically in prioritisation of biodiversity. Sustainability questions were posed after the values questions, in order to reduce the risk of the subject matter influencing value responses.

No data were collected to determine which respondents were members of which network. However, a skew in the sample towards SME leaders based in the South-West of England is acknowledged, as this is where two of the networks approached are primarily based. Data were destroyed once the research had concluded.

The research questionnaire largely made use of published questions and approaches in Steg et al. (2005) and De Groot and Steg (2008) that use the VBN framework (De Groot & Steg, 2008, 2009; Steg et al., 2005; Stern, 2000). Wording of some questions was minimally adjusted to provide a biodiversity focus.

Following these approaches, the questionnaire comprised five sections.

- Section 1: Firstly, values of respondents were determined using the widely respected Rokeach value survey (Rokeach, 1973; Schwartz et al., 2012; Schwartz & Bilsky, 1987; Stern et al., 1993) in the format of the model outlined by Stern et al. (1993), presenting values representative of three value sets: egoistic, altruistic and biospheric (Figure 1). Biospheric values place the natural environment at higher importance than personal gain, and altruistic values relate to a sense that the well-being of others and an equitable society are of the highest importance. Biospheric and altruistic values both represent a 'bigger-than-self' understanding of the

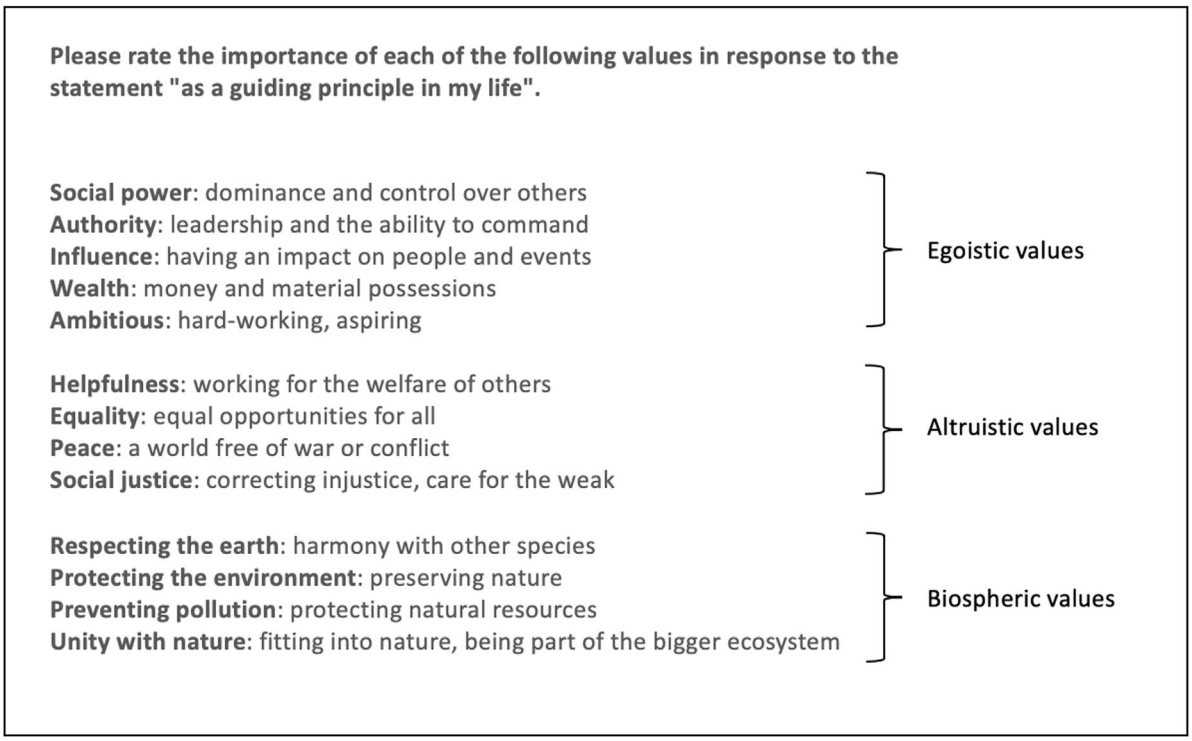

FIGURE 1 Values respondents were requested to score and the grouping of value sets for scoring.

world. Egoistic values focus on the personal gain, power and influence of the individual (Stern, 2000). In line with the approach taken in previous VBN studies, questions determining the value orientation of respondents employed a 9-point Likert scale devised by Schwartz (1992), rating values from 0 (not important) through to 7 (of supreme importance) and included the option of −1 (opposed to my values) to assess each element's importance to the respondent. As recommended in previous studies (De Groot & Steg, 2008; Schwartz, 1992), respondents were encouraged to spread their scores across the full ranges and also to limit the number of values they selected as 'of supreme importance'.

- Section 2: To assess attitudes towards the environment and to better understand how respondents related to nature, the well-established new environmental paradigm (NEP) questions

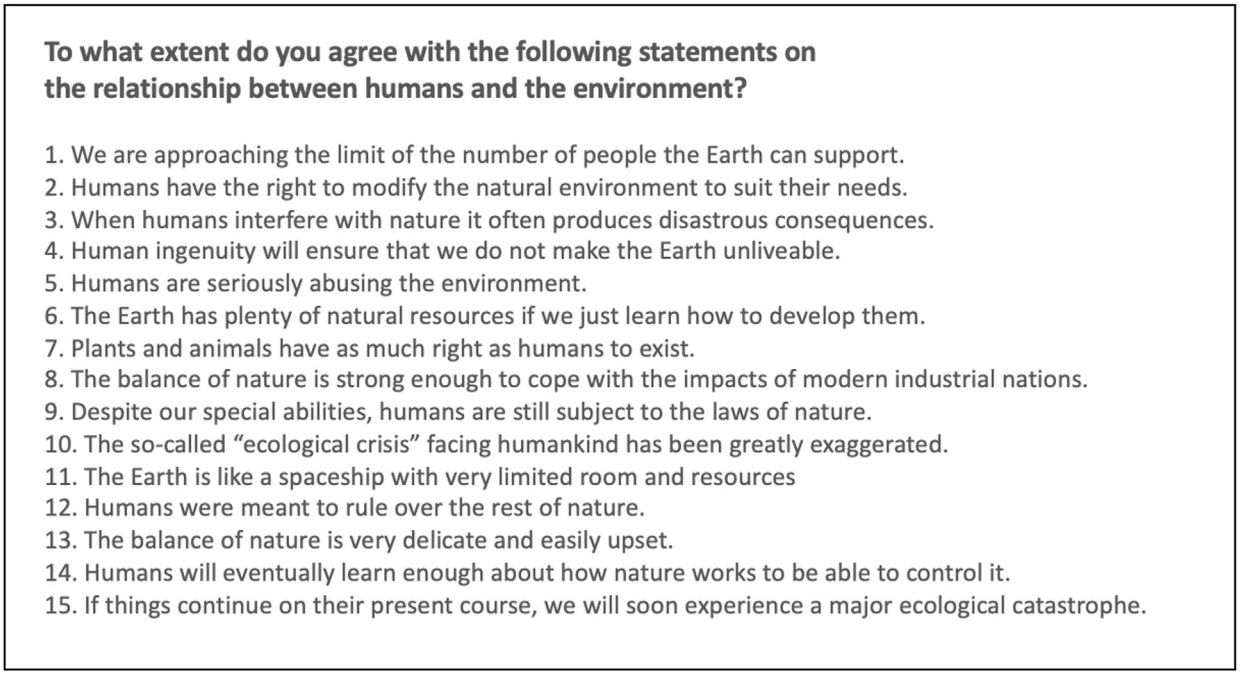

FIGURE 2 New environmental paradigm statements.

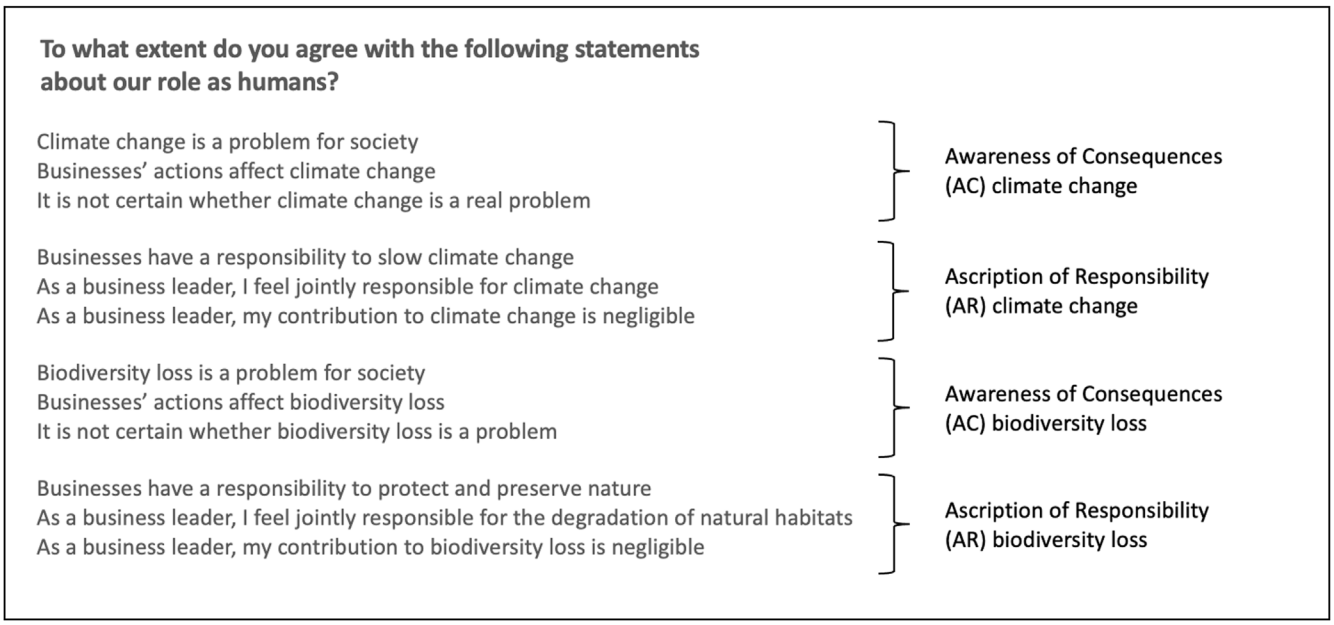

FIGURE 3 Awareness of consequences (AC) and ascription of responsibility (AR) statements for climate change and biodiversity loss and the grouping of AC and AR sets for scoring.

(Dunlap, 2008; Dunlap et al., 2000; Hawcroft & Milfont, 2010) were used. Respondents were asked to score to what degree they agree with the statements depicted in Figure 2. As recommended by Hawcroft and Milfont (2010), following their extensive analysis of NEP implementations of the past 30 years, a 5-point Likert scale was used for the NEP questions in this study.

- Section 3: The third section posed 'awareness of consequences' (AC) and 'ascription of responsibility' (AR) questions as structured by Steg et al. (2005). Wording was adjusted to reflect consequences and perceived responsibility towards climate change and biodiversity loss (Figure 3).
- Section 4: To assess the degree to which polled SME leaders engage with sustainability within their business, respondents were asked to select the most appropriate option from five categories describing organisational levels of engagement with sustainability, from 'the primary purpose of the organisation is related to environmental sustainability' through to 'it's not something that is relevant to the organisation'.
- Section 5: Finally, in order to assess the prioritisation of biodiversity, the Global Reporting Initiative (GRI) reporting standards (Global Reporting Initiative, 2022) were grouped to create eight broad categories of environmental sustainability that could be understood by respondents without specific expertise. These categories were biodiversity, emissions, energy, environmental compliance, materials, supplier environmental assessment, waste, and water and effluents. Respondents were asked to select from and rank these areas of environmental sustainability in line with how they are prioritised within their organisation.

Mean scores were calculated from the numeric Likert-scale responses for each group of values, creating a measure of biospheric, altruistic and egoistic value orientation for each respondent. Cronbach's alpha was applied to determine the internal validity of the resulting scores. The same process was applied to NEP, AC and AR scores, providing measures of level of environmental concern; AC and AR for both climate change and biodiversity loss. Once calculated, the resulting scores were treated as measures on a scale and thus analysed as continuous data. Wilcoxon signed rank was applied for comparison of means across related samples where appropriate.

4 | RESULTS AND ANALYSIS

The survey attracted 102 respondents with a completion rate of 77%. Non-completes were excluded from the analysis. The remaining data set of 78 respondents was filtered to remove businesses with more than 250 employees that therefore do not fit within the UK Government's definition of SME (Department for International Trade, 2020), any international businesses and any respondents who did not hold a senior enough position within the organisation to be considered a leader within the context of this research. In addition, as the study was specifically interested in businesses that already demonstrate an awareness of their responsibilities towards environmental sustainability, a further three respondents were removed from the sample based on their response to section 4 of the survey that sustainability was not considered relevant to the business. It is worth noting the significance of there still being business leaders who feel environmental sustainability is irrelevant to their organisation, a concerning finding that warrants further research. However, for the purposes of this study, a sample of 61 respondents remained for analysis. No statistical analysis of significance of finding was undertaken as this was not necessary to classify by SME size, and the selection criteria were perceived to be the most representative cross section of participant SMEs possible using the outreach and survey methods. Potential self-selection bias is acknowledged, in terms of both SME leaders being part of the networks polled and as a subset of respondents to survey requests.

Over half of the respondents identified themselves as leaders within micro-businesses of nine or fewer employees, and the rest were from small- and medium-sized businesses (Table 1). ONS data show that of the 5.6 million SMEs in the UK, 5.3 million are micro-businesses (Hutton & Ward, 2021); therefore, the higher number of micro-businesses in the data set is in line with expectations of a sample of the UK SME population. This said, the study cannot claim to have a sample that is representative of the UK, as the study had the specific intention of only recruiting self-selecting pro-sustainability SMEs. Though, with this caveat, the study broadly reflects the range and diversity of different employee size bands.

The sample contained a balanced spread of gender representation across the range of leadership positions as seen in Appendix A: Founder, CEO, Managing Director and Director or Senior Leadership, with a higher proportion of male respondents. The majority of respondents (64%) were from for-profit organisations, with the remaining 26% representing charitable or socially beneficial organisations. A wide range of industries was represented in the sample (Figure 4). It is important to acknowledge that whilst the sample provides a good representation of the breadth of business models, industries and sizes of business within the SME community for the scope of this study, further data would need to be collected to explore subsets of this community in detail, such as comparative analysis between for-profit and not-for-profit business models.

4.1 | Value orientation

In order to address the research question, the propensity towards different value sets of respondents first needed to be established to

TABLE 1 Breakdown of size of respondents' organisations by number of employees.

Number of employees	Count
0–9	37
10–49	16
50–249	8
Total	**61**

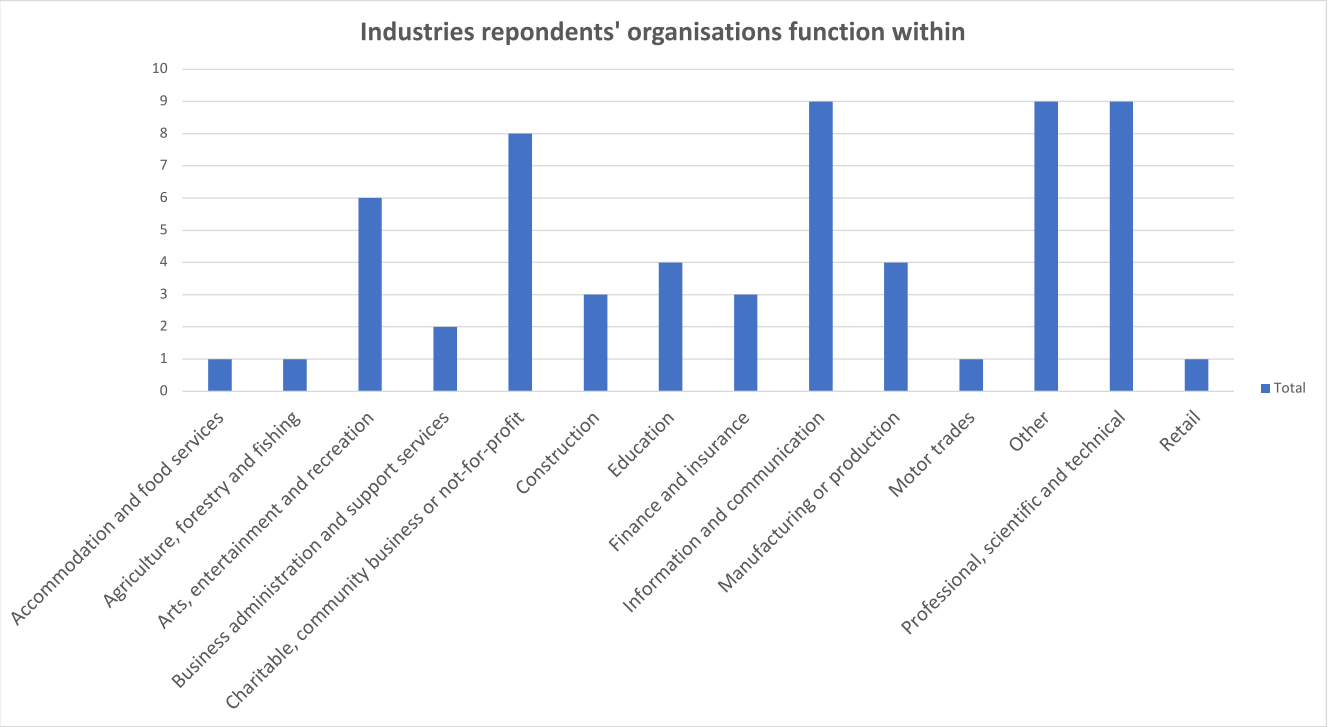

FIGURE 4 Responses to the question, 'Which industry best describes your organisation's main focus?'.

TABLE 2 Mean scores for the three assessed value sets.

					Confidence interval 95%	
	Cronbach's alpha	Mean	Standard deviation	Standard error	Lower bound	Upper bound
Biospheric value set	0.940	5.62	1.505	0.193	5.238	6.008
Altruistic value set	0.772	5.61	1.107	0.142	5.327	5.894
Egoistic value set	0.658	3.12	1.148	0.147	2.827	3.415

ascertain dominance of a bigger-than-self value orientation. The mean score of the corresponding questions for each value grouping (biospheric, altruistic and egoistic) was taken to provide a measure of the importance placed on each by the respondent, from here on referred to as their value scores. Cronbach's alpha test was applied to value determination, verifying the acceptable internal validity of these groupings: biospheric CA 0.940, altruistic CA 0.772 and egoistic CA 0.658. As shown in the mean scores displayed in Table 2, the sample shows a higher propensity for biospheric and altruistic values than egoistic; thus, we can conclude that respondents showed a strong bigger-than-self value orientation.

4.2 | Level of environmental concern

Next, levels of environmental concern were determined through analysis of NEP responses. The mean NEP score of respondents was 4.07, within a relatively small standard deviation (0.401) with very few outliers. This is a comparatively high score in relation to studies on other populations of adults. In Hawcroft and Milfont's (2010) analysis of 139 NEP studies, the mean NEP score across all of these was 3.75. This indicates strong environmental awareness and pro-environmental attitudes within the population of SME leaders sampled in this study.

Having established a strong bigger-than-self value orientation and high level of environmental awareness, analysis of AC and AR for both climate change and biodiversity loss was conducted through generating a mean score as a measurement for each grouping (see Table 3). Cronbach's alpha tests for internal validity were good at 0.816 for AC and 0.753 for AR.

Reviewing the scores visually demonstrates a strong AC around climate change (Figure 5) and biodiversity loss (Figure 6), with a slightly lower score for biodiversity. Statistical significance was found between the climate change and biodiversity scores when tested using the Wilcoxon signed-rank method for comparison of means across related samples ($z = -2.678$, asymp. sig. 2-tailed $= .007$), indicating consistently lower scores for the AC of biodiversity loss in comparison with climate change.

TABLE 3 Means scores for AC and AR climate and biodiversity.

	Mean	Standard deviation	Standard error	Confidence interval 95%	
				Lower bound	Upper bound
AC climate	4.814	0.473	0.061	4.6929	4.9355
AC biodiversity	4.628	0.599	0.077	4.475	4.782
AR climate	4.235	0.631	0.081	4.074	4.396
AR biodiversity	3.967	0.704	0.090	3.787	4.147

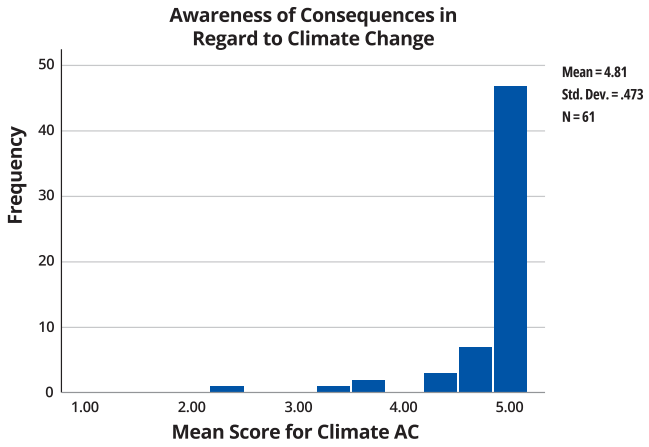

FIGURE 5 Visual representation of frequency of respondents' awareness of consequences (AC) scores for climate change.

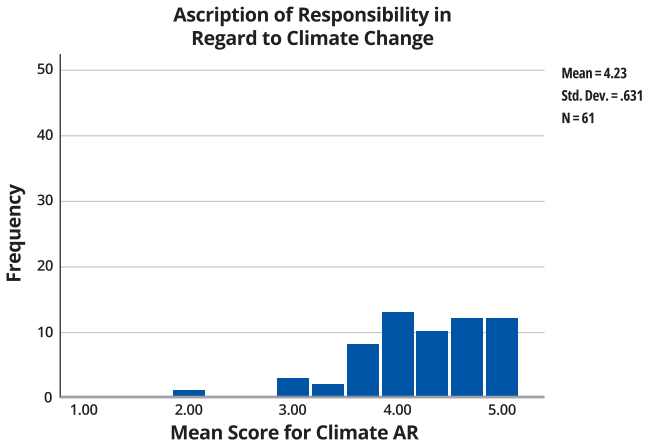

FIGURE 7 Visual representation of frequency of respondents' ascription of responsibility (AR) scores for climate change.

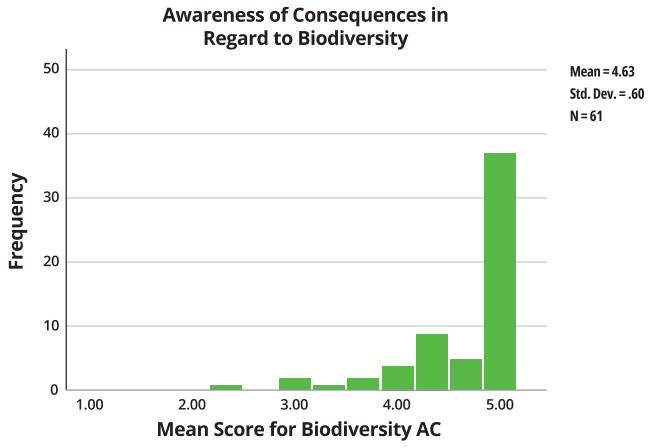

FIGURE 6 Visual representation of frequency of respondents' awareness of consequences (AC) scores for biodiversity loss.

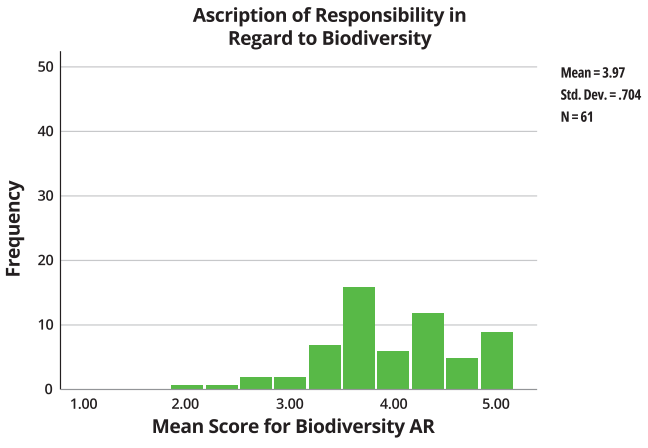

FIGURE 8 Visual representation of frequency of respondents' ascription of responsibility (AR) scores for biodiversity loss.

AR scores are slightly lower. Again, the Wilcoxon signed-rank test showed significance in the lower scores for biodiversity in comparison with climate change ($z = -3.842$, asymp. sig. 2-tailed = <.001), suggesting that respondents were less strongly accepting of their responsibility towards biodiversity loss (Figure 7) in comparison with climate change (Figure 8).

Overall, the analysis of NEP and AC/AR scores shows a high level of environmental concern from respondents and a strong awareness of the consequences of climate change and biodiversity loss. They also indicate a slightly lower acceptance of responsibility for these aspects of our planetary crisis, with acceptance of responsibility for addressing biodiversity lower than that for climate change.

4.3 | Recognition and prioritisation of aspects of the environment

The final exploration was to determine if these leaders with bigger-than-self value orientation and high levels of environmental concern are prioritising biodiversity within their organisations. Respondents were presented with a list of eight areas of environmental sustainability and asked to select up to five that are priorities for their business. Many respondents selected fewer than five options, indicating that for some, only a narrow view of environmental sustainability is considered a priority to these business leaders. Figure 9 displays the percentage of respondents who selected each priority area, arranged from most frequently selected to least frequently selected. Energy, waste, materials and emissions were the four most frequently selected areas of priority, with energy being selected by 77% of respondents. Biodiversity was the second lowest priority, selected by 30% of the sample set. 'Water and effluents' was the only area scoring lower, with just 10% of respondents selecting this as a priority.

Respondents were then asked to rank their selections in order of importance for the business. Energy, emissions and environmental

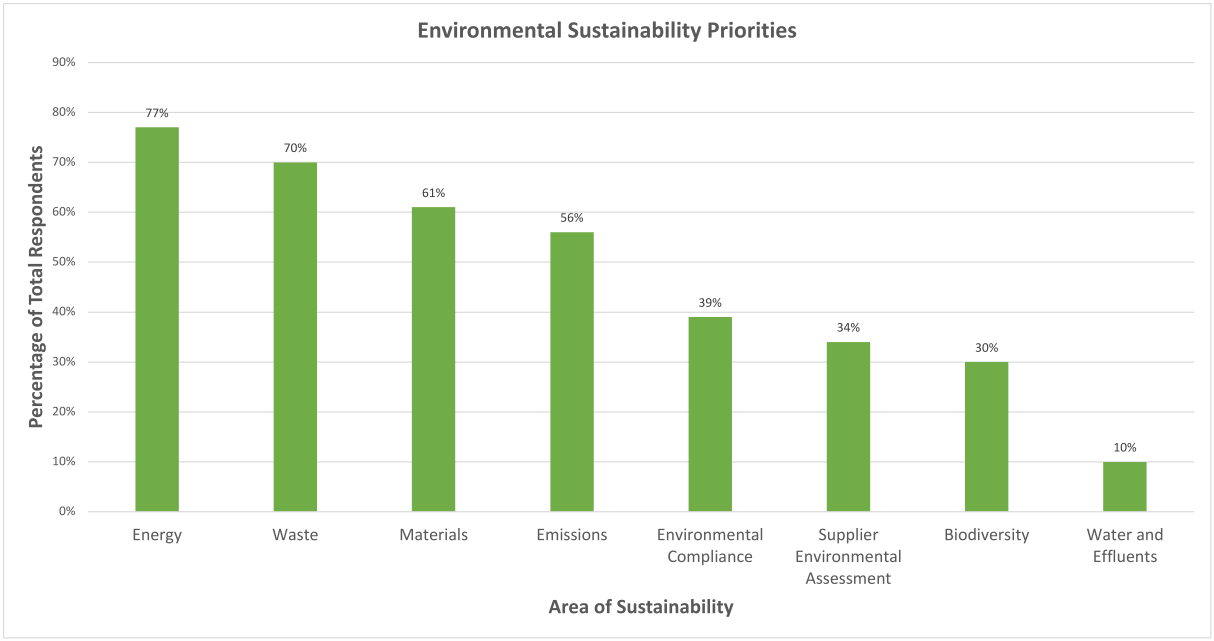

FIGURE 9 Percentage of respondents selecting area of sustainability as a priority.

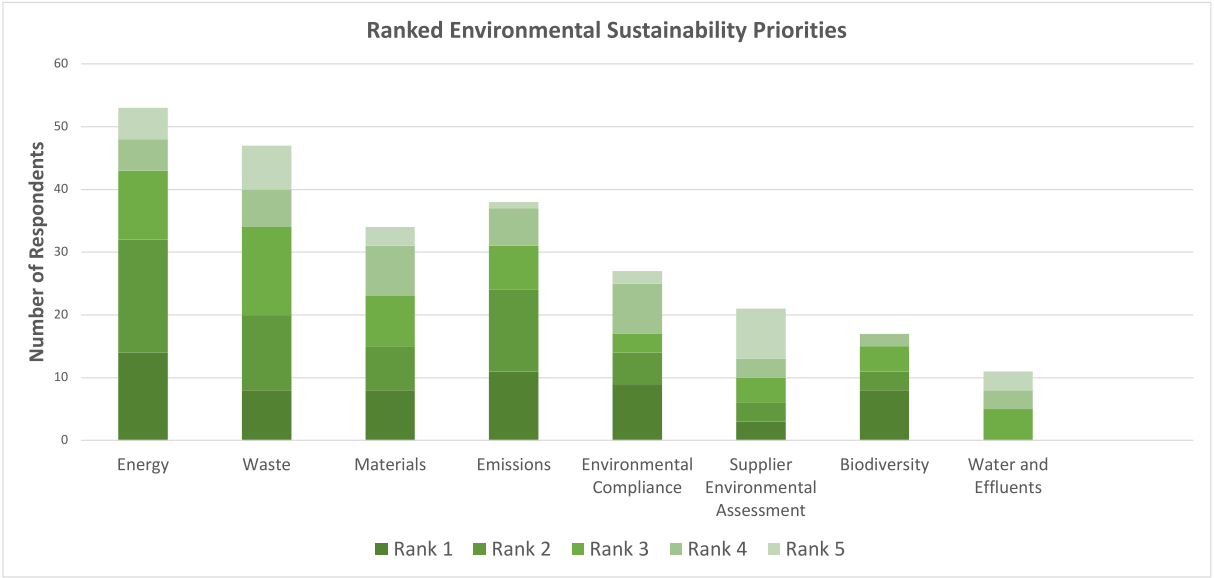

FIGURE 10 Area of sustainability ranked by importance.

compliance were most frequently ranked of highest importance (Figure 10). This indicates that biodiversity is not often considered a priority and does not hold the same level of importance within businesses as areas such as energy use, waste management and sustainability of materials. However, it is worth noting that when it was selected as an area of priority for businesses, biodiversity was then often ranked of high importance, as can be seen in Figure 7.

5 | DISCUSSION

The results of this study indicate the sampled SME leaders who include environmental sustainability as part of their business strategy or approach have primarily bigger-than-self value orientation. No respondents indicated that they were opposed to, or placed little or no importance on, biospheric values. Respondents also showed a strong orientation towards altruistic values, indicating a strong sense of concern for the well-being of other people and society (Stern, 2000). This high propensity towards bigger-than-self (biospheric and altruistic) values, along with high NEP scores and high AC scores, are all strong indicators that these leaders are environmentally conscious and understand the severity of the ecological crisis. However, despite strong bigger-than-self values and high levels of environmental concern, the analysis also indicates that biodiversity is not yet being prioritised by these leaders.

5.1 | Leaders with bigger-than-self values feel less responsible for biodiversity loss than for climate change

One area where this lower prioritisation is evident is in the comparison of AC and AR scores. AC scores for biodiversity loss were demonstrated to be slightly lower in respondents than those for climate change, and scores for AR for biodiversity loss were demonstrated to be consistently lower than those for climate change, suggesting a lower acceptance of responsibility around biodiversity loss. This is problematic because changes in the global climate have a direct impact on biodiversity, and vice versa (Bellard et al., 2012; Folkard-Tapp et al., 2021; Kabisch et al., 2016), such that loss or degradation of habitats and species increases the likelihood of climate instability. This type of symbiotic relationship demonstrates the complexity of achieving environmental sustainability and the need for systems-thinking approaches to resolve these crises (Palmberg et al., 2017; Williams et al., 2017). It is estimated that between 11% and 16% of biodiversity loss can be attributed to climate change, the rest coming from unfavourable use of land and sea, over-exploitation, pollution and introduction of invasive species (WEF, 2020, p. 8). Therefore, solutions implemented to address climate change cannot automatically be assumed to address the biodiversity crisis. It is essential for businesses to explicitly consider their impacts upon and ability to restore biodiversity, not to simplify and solely consider climate change drivers.

5.2 | Biodiversity is still overlooked by leaders with bigger-than-self values

Sustainability areas such as energy, waste and materials were identified as priorities by a large proportion of these leaders, indicating pro-environmental behaviours. This aligns with the predominant findings of the existing body of research that people in the workplace with strong biospheric values tend to have stronger pro-environmental attitudes and beliefs and in turn exhibit more pro-environmental behaviours (Lu et al., 2019; Ruepert et al., 2017; Uddin et al., 2021). However, supporting the finding of a lower priority ascribed to biodiversity, only a third of respondents selected biodiversity within their business sustainability priorities (compared with 77% selecting energy, 70% waste and 61% materials). These findings suggest that, despite the respondent population having strong biospheric values and a high level of environmental concern, biodiversity is assigned only a low priority and is not perceived as an area of responsibility. Yet as identified at the beginning of the study, these very prevalent businesses cumulatively have a large impact on the environment and biodiversity. As discussed earlier, the lower AR score for biodiversity indicates that these SME leaders feel a lower level of responsibility towards biodiversity than for climate change; however, the mean AR score for biodiversity was still 3.967, indicating that some level of responsibility towards biodiversity loss is felt. This raises a key question of why biodiversity is not considered a priority by so many of these leaders.

5.3 | A lack of clarity around financial and policy drivers

One potential reason for more sampled SME leaders selecting as priorities 'Energy' (77%), 'Water' (70%) and 'Materials' (61%) are that these aspects have resource cost implications, and the factors 'Emissions' (56%) and 'Environmental Compliance' (39%) have implications for business liabilities, as do 'Supplier Environmental Assessment' (34%). The low number of sampled SME leaders prioritising 'Water and Effluents' (10%) is likely to be linked to the resource cost and legal liabilities already having been factored respectively into 'Water' and 'Emission' /'Environmental Compliance'. This leaves 'Biodiversity' (30%) as an outlier as the connections between biodiversity and business performance or regulation have not been strongly recognised or drawn. Wagner (2022) identified that widely used environmental standards ISO 14001 and EMAS do not adequately incorporate biodiversity, whilst Smith et al. (2020) demonstrated that current reporting requirements businesses must meet do not encourage explicit accounting of biodiversity conservation efforts. This suggests stronger regulation and clearer connection to business liabilities is necessary to prompt transparency when reporting impacts and a higher prioritisation of biodiversity.

However, it is also important to note the need for a shift in approach from mitigation of negative impacts towards opportunity for positive impact. In common with management of pollution, and indeed the vast bulk of chemical regulations based on potential negative

outcomes based narrowly on hazard rather than on life cycle risk (Everard & Blume, 2019), there is a tendency for business leaders to approach sustainability issues primarily in terms of mitigating their negative impact. The reality is more complex and for two principal reasons. Firstly, nature is a primary resource (reliability of water and material supplies, dilution of wastes, regulated climate reducing severe storm and flooding events, etc.) rather than just something to be protected on altruistic or legally enforced grounds. Secondly, changed business practices, such as fishery, forest or agricultural reforms, can actively rebuild ecosystems and, with them, their supportive capacities that may have direct business pay-back (including increased supply chain resilience) as well as multiple indirect benefits (such as supplier and customer loyalty, favoured status by investors and landlords, 'conservation' branding, etc.).

5.4 | Higher priority is given to measurable impacts

Another possibility for a lack of prioritisation of biodiversity is an absence of success measures. The ability to demonstrate progress towards sustainability, particularly in a business context, is strongly connected to data collection and comparable measurements over time (Das et al., 2022; Garcia et al., 2016; King, 2015) and the ability to find simple, meaningful measures and indicators (Addison et al., 2020; Bell & Morse, 2012; Waas et al., 2014). Strategies are considered more likely to succeed if they are underpinned by concise measures that are also perceived as business-relevant (Kaplan & Norton, 2005; Stopps, 2022). Thus, leaders who want to achieve meaningful, positive impact in their environmental strategies are likely to focus on areas they feel confident they can affect and measure progress. Approaches such as life-cycle assessment are well researched (Berger & Finkbeiner, 2011; Borrion, 2021; Chau et al., 2015) providing guidance for monitoring impacts such as energy use, materials and waste—the areas most commonly selected by respondents in this study as high priority. Climate-active gaseous emissions are also now largely considered measurable, with organisations such as Project Drawdown and the GHG Protocol providing standardised, comprehensive guidance for businesses on how to measure, monitor and reduce their emissions (Drawdown Labs, 2021; GHG Protocol, 2021). These are all areas selected most commonly as priorities by respondents in this study and are generally well-defined and accepted, albeit with residual debates and inconsistencies about exactly what and how to measure.

By contrast, direct relevance of biodiversity to business success has been poorly defined and accepted, other than for aspects of environmental damage (such as pollution) that are regulated. Biodiversity monitoring is also less well defined with far fewer broadly accepted metrics (Anderson, 2018), particularly in the context of their relevance to business performance, and businesses have made insufficient progress towards creating measurable and time-bound objectives for their biodiversity commitments (zu Ermgassen et al., 2022). Shifting baselines also cause uncertainties, with systematic declines of biodiversity over recent decades meaning that a rational datum for what constitutes a healthy ecosystem is hard or impossible to define (Braverman, 2019; Duarte et al., 2009) creating debate about what meaningful change to these numbers might look like. Biodiversity monitoring techniques are therefore often complex and flawed (Fairbrass et al., 2017; Jones et al., 2018; Normander et al., 2012) as well as expensive and time-consuming, requiring outside expertise (Qi et al., 2008). This could provide some explanation as to why biodiversity was considered a lower priority by SME leaders, despite their tendencies towards pro-environmental business practices more broadly. The Science Based Targets Network has recognised this barrier, and at the time of writing, a framework of science-based targets for nature is in development to facilitate business action on biodiversity loss (SBTN, 2021).

5.5 | The importance of a collective mindset for SMEs

Wagner (2022) found that SMEs take comparatively less action on biodiversity than larger firms. A likely factor in biodiversity being overlooked or deprioritised by these leaders of smaller businesses is that the effects of individual SME operations on biodiversity may seem too small and distant from the bigger picture for them to seem relevant. However, with an estimated 5.6 million SMEs in the UK, and 5.3 million of these falling into the category of micro-businesses (Hutton & Ward, 2021), the collective impact potential on the natural environment is very substantial. The same principle applies, for example, to small emissions of radioactivity or asbestos. SMEs need to understand their collective impact rather than thinking they are too small to have a significant impact. Recognising full value and dis-value implications and their connection to context are key to successful transitions (Bradley et al., 2020), as well as taking adequate account for the environment as a stakeholder (Evans et al., 2017).

In addition, smaller businesses often lack resources (Bos-Brouwers, 2010; Shields & Shelleman, 2015) and knowledge (Gadenne et al., 2009) for prioritising sustainability challenges. When considered in line with the barriers and complexities in understanding and measuring impacts on biodiversity outlined in this discussion, it can be concluded that resource and knowledge limitations are likely to be factors in biodiversity being overlooked as a strategic priority. As outlined by Lewis et al. (2015), collaboration between SMEs can overcome these barriers, increasing capability for environmentally positive activity. Networks such as The Future Leap Network (https://futureleap.co.uk/network/) and SME Climate Hub (https://smeclimatehub.org/) aim to facilitate stronger collaboration between businesses and attract a strong SME membership; therefore, a stronger focus on biodiversity within these support networks could encourage higher prioritisation of biodiversity amongst SME leaders. Intuitive heuristics, such as the 'Mitigation Hierarchy' (1, avoid; 2, minimize; 3, restore; and 4, offset) suggested by Milner-Gulland et al. (2021) to guide decisions towards a 'no net loss of biodiversity' target, can help guide decision-making in resource-limited SMEs in much the same way that the well-established 'Waste Hierarchy' (avoid-reduce, reuse, recycle) is helpful for waste reduction and circular economic goals.

5.6 | Connecting business to nature

Although various recent narratives around the importance of biodiversity to business sustainability have focused on monetisation of the benefits of sustainable practices (Goh et al., 2013; Ulrich et al., 2019), biodiversity itself is incommensurable with monetary approaches. Work on ecosystem services frameworks has delivered some degree of attaching tangible value to the benefits delivered to humanity by nature (Lähtinen et al., 2016), though many of these ecosystem services (e.g., highly culturally relative spiritual and aesthetic services, most of the supporting services and many regulating services) do not have objective monetary values as the economy is a subset of society, itself wholly dependent subsystem of the supporting ecosystem (Bartkowski et al., 2015; Everard, 2022).

Valuation of nature is in reality plural as, for example, reflected in the four qualitatively differing ecosystem services defined by the Millennium Ecosystem Assessment (2005). In reality, business is dependent upon a wide range of these services from nature beyond narrow monetisable assets such as resource costs and waste charges. Customer, employee and shareholder relationships with businesses are shaped by perceptions of social and ecological responsibility as, for example, in the case of growing value chain rejection of businesses reliant on palm oil (Ruiz, 2018). In *The Business of Biodiversity*, Everard (2009) set the multifaceted interactions between ecosystems and businesses in terms of risks: Businesses are competent at risk management so setting often overlooked interactions with ecosystems in those terms helps articulate the importance of biodiversity for business success.

5.7 | Other findings worthy of research attention

This paper focused on exploring the prioritisation of biodiversity in SMEs in connection with the values of leadership. In the course of this research, other potential research areas requiring further investigation became evident.

Analysis of NEP, AC and AR elements of the VBN framework indicates that, whilst respondents strongly recognised the pending ecological crisis and the severity of its consequences, they did not feel as strongly about their responsibility for it. Some aspects of this have been discussed above, particularly concerning the perceived relevance of the links between ecosystems and business success, though further research is required not only to draw out these multiple links but also to express them in terms evident and persuasive to business leaders.

Water and effluents were also found to be assigned the lowest priority by sampled SME leaders. It is suggested that aspects of this are that issues of 'Water' and 'Emission'/'Environmental compliance' had been recognised already in terms of resource costs and legal liabilities. This proposition needs further testing, including how SME leaders interpret these terms.

It is also worth noting that, in responses to the question determining how embedded sustainability practices are in the business, three respondents selected 'it is not something that is relevant to our organisation'. Despite it being a very small number of respondents, this does flag a very concerning issue that there are still SME leaders who do not recognise environmental sustainability as something that is relevant to all businesses.

6 | CONCLUSION

The study set out to investigate if leaders of sustainability-focused SMEs, who have bigger-than-self values are recognising and prioritising biodiversity. Research was conducted via a quantitative survey targeted at SME leaders within a number of sustainability-focused business networks. The values of a self-selecting subset of SME leaders already demonstrating engagement with environmental sustainability within their organisations were explored, paying particular attention to their prioritisation of biodiversity. Using VBN theory, the likelihood of pro-environmental behaviour was determined based on an assessment of the values, level of environmental concern and attitudes of survey respondents. The findings supported previous VBN studies, indicating business leaders with high bigger-than-self (biospheric and altruistic) values demonstrate pro-environmental behaviours through their approach to environmental sustainability. However, the key empirical finding of the study was that biodiversity is not commonly included as a priority or area of responsibility amongst these leaders despite strong bigger-than-self value orientation. This indicates that, even for business leaders exhibiting pro-environmental behaviours, biodiversity is not yet recognised as an essential part of business sustainability.

The initial discussion of the results explores which elements of environmental sustainability were selected as priorities by leaders and suggests a number of reasons why biodiversity is not seen as business-critical in the ways that potentially costly resources and legal risk aspects are. It is suggested that raising awareness of the plurality of values of ecosystems and how these can translate as business risks may help SME leaders better engage with the full footprint of the activities of their enterprises on nature and the range of qualitatively differing advantages that engagement with biodiversity as a strategic priority may yield. This may be bolstered by a stronger regulatory environment, addressing aspects of biodiversity in as clear and well-regulated a manner as control of 'Emissions' and enforcement of 'Environmental compliance'.

The outcomes of this research highlight a significant disparity between the urgent action required of SMEs in addressing biodiversity loss and the level of importance it is currently allocated by SME leaders. The findings suggest a need for stronger prioritisation of biodiversity within small- and medium-sized businesses. There is also indication that biodiversity is not accepted as a responsibility for business leaders to the same degree as climate change and as such the symbiotic relationship between these two things is yet to be fully grasped.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX A: GENDER SPLIT