

# Electronic Supplementary Material for

## Gaps and overlaps between sustainability science and the environmental humanities

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Contents:

<b>1. Supplementary methods.....</b>	<b>2</b>
1.1. Limitations associated with the literature databases .....	2
1.2. Limitations associated with the search strategy .....	2
<b>2. Supplementary results.....</b>	<b>8</b>
2.1. Literature mapping analysis .....	8
2.2. Lexical analysis .....	15
2.3. Checking for result robustness .....	20
<b>3. References .....</b>	<b>24</b>

## 1. Supplementary methods

### 1.1. Limitations associated with the literature databases

A key limitation of this study relates to existing bias in the Web of Science (WoS) and Scopus databases. Both databases are effectively known to underrepresent publications that (i) are published in languages other than English, (ii) are not internationally oriented, (iii) are poorly cited, (iv) originate from non-Western countries, or (v) fall under the social sciences (Mongeon and Paul-Hus 2016; Zhu and Liu 2020). Nonetheless, WoS and Scopus remain the most exhaustive and authoritative academic databases for high standard peer-reviewed literature, and further offer a large panel of metadata and powerful search engines. This is why they are the most-used databases for standardized international literature analyses as the one presented in this study.

In addition, we note that WoS and Scopus search engines have some limitations that prevented the inclusion of certain articles. For example, the PNAS journal has a sustainability science section (<https://www.pnas.org/sustainability-science>), and the Australian Humanities Review has an “Ecological humanities” section (<http://australianhumanitiesreview.org/category/archive/ecohumanities/>). We consider that all the publications included in these topical sections would have been relevant to our analysis. Yet, including them was not possible because WoS and Scopus search engines do not allow to filter publications on the basis of journals’ topical sections. As a consequence, we acknowledge that our two literature corpuses are not entirely exhaustive.

That being said, our science mapping analysis is based on a sample of more than 2,500 publications from the WoS, which key results are consistent with a second science mapping analysis based on a second sample of more than 4,300 publications from Scopus (see section 2.3 of ‘Supplementary Results’). Because of the large size of the two literature samples and the consistence between the two analyses, we can reasonably argue they are representative samples of the targeted literature.

### 1.2. Limitations associated with the search strategy

We acknowledge that our non-normative literature search strategy might have reinforced the contrast highlighted between SustSci and EnvHum. As our analysis focused on literature explicitly associated with one research field or the other, it neglected a large body of scholars that could have been considered as part of these fields. For example, in a recent SustSci literature review, Clark and Harley (2020) relied on an expert-based approach to identify relevant literature, and included research programs on environmental justice. If we had done the same, this might have reduced the contrast between SustSci and EnvHum on power and domination issues. Yet such a broad, author-driven choice would have created an irresolvable tautology, as explained in the article’s ‘Materials and methods’ section. We argue that only a non-normative search strategy was well suited for an agnostic comparison of the research fields of SustSci and EnvHum.

Table S1: Search strings used for the identification of SustSci and EnvHum literature, and the number of results obtained from the WoS (searches submitted on 2 February 2022).

Description	Query	No. of results	
<b><u>Sustainability science literature (SustSci)</u></b>			
#1	Publications explicitly mentioning “sustainability science(s)”	TS= (“sustainability science*”) AND PY=(1950–2021)	1333
#2	Publications explicitly mentioning “science for sustainable development”	TS= (“science for sustainable development”) AND PY=(1950–2021)	72
#3	Publications in journals whose name contains the term “sustainability science(s)”	SO= (“sustainability science*”) AND PY=(1950–2021)	1082
#4	Aggregation of the three abovementioned queries	#1 OR #2 OR #3	2274
<b><u>Environmental humanities literature (EnvHum)</u></b>			
#5	Publications explicitly mentioning “environmental humanities”	TS= (“environmental humanities”) AND PY=(1950–2021)	321
#6	Publications explicitly mentioning “ecological humanities”	TS= (“ecological humanities”) AND PY=(1950–2021)	7
#7	Publications in journals whose name contains the terms “environmental humanities” or “ecological humanities”	SO= (“environmental humanities” OR “ecological humanities”) AND PY=(1950–2021)	194
#8	Aggregation of the three abovementioned queries	#5 OR #6 OR #7	500
<b><u>Global literature corpus (SustSci and EnvHum)</u></b>			
#9	Global literature corpus merging both SustSci and EnvHum literature	#4 OR #8	2774

TS: field tag in the WoS that allows to search within publication’s title, abstract, author keywords and keyword Plus.

SO: field tag in the WoS that allows to search within source’s name (e.g. journal or book title)

PY: field tag in the WoS that codes for publication year.

Table S2: List of the most-cited references in *SustSci* and *EnvHum* that were read to enrich our results' interpretations and discussion.

Authors	Title	Year	Publication source
<b>Most-cited references in EnvHum</b>			
Blaise M., Hamm C., Iorio J.M.	Modest witness(ing) and lively stories: paying attention to matters of concern in early childhood	2017	Pedagogy, Culture and Society
Burke A., Fishel S., ..., Levine D.J.	Planet Politics: A Manifesto from the End of IR	2016	Millennium: Journal of International Studies
Caminero-Santangelo B.	Different shades of green: African literature, environmental justice, and political ecology	2014	Different Shades of Green: African Literature, Environmental Justice, and Political Ecology
Castree N.	Changing the Anthro(s)cene: Geographers, global environmental change and the politics of knowledge	2015	Dialogues in Human Geography
Davis J., Moulton A.A., ..., Williams B.	Anthropocene, Capitalocene, ... Plantationocene?: A Manifesto for Ecological Justice in an Age of Global Crises	2019	Geography Compass
DeLoughrey E., Didur J., Carrigan A.	Global ecologies and the environmental humanities: Postcolonial approaches	2015	Global Ecologies and the Environmental Humanities: Postcolonial Approaches
Houston D., Hillier J., ..., Byrne J.	Make kin, not cities! Multispecies entanglements and 'becoming-world' in planning theory	2018	Planning Theory
Minteer B.A., Manning R.E.	An appraisal of the critique of anthropocentrism and three lesser known themes in Lynn White's "The historical roots of our ecologic crisis"	2005	Organization and Environment
Neimanis A., Åsberg C., Hedrén J.	Four problems, four directions for environmental humanities: Toward critical posthumanities for the anthropocene	2015	Ethics and the Environment
Pain R.	Chronic urban trauma: The slow violence of housing dispossession	2019	Urban Studies
Palsson G., Szerszynski B., ..., Weehuizen R.	Reconceptualizing the 'Anthropos' in the Anthropocene: Integrating the social sciences and humanities in global environmental change research	2013	Environmental Science and Policy
Pooley S., Barua M., ..., Milner-Gulland E.J.	An interdisciplinary review of current and future approaches to improving human-predator relations	2017	Conservation Biology
Rigby K.	Dancing with disaster: Environmental histories, narratives, and ethics for perilous times	2015	Dancing with Disaster: Environmental Histories, Narratives, and Ethics for Perilous Times
Sörlin S.	Reconfiguring environmental expertise	2013	Environmental Science and Policy
Taylor A., Pacini-Ketchabaw V.	Learning with children, ants, and worms in the Anthropocene: towards a common world pedagogy of multispecies vulnerability	2015	Pedagogy, Culture and Society
<b>Most-cited references in SustSci</b>			
Korhonen J., Honkasalo A., Seppälä J.	Circular Economy: The Concept and its Limitations	2018	Ecological Economics
Walker B., Holling C.S., ..., Kinzig A.	Resilience, adaptability and transformability in social-ecological systems	2004	Ecology and Society
Turner B.L., Kasperson R.E., ..., Schiller A.	A framework for vulnerability analysis in sustainability science	2003	Proceedings of the National Academy of Sciences of the United States of America
Lang D.J., Wiek A., ..., Thomas C.J.	Transdisciplinary research in sustainability science: Practice, principles, and challenges	2012	Sustainability Science

Coccia M.	Factors determining the diffusion of COVID-19 and suggested strategy to prevent future accelerated viral infectivity similar to COVID	2020	Science of the Total Environment
Ostrom E.	A diagnostic approach for going beyond panaceas	2007	Proceedings of the National Academy of Sciences of the United States of America
Reynolds J.F., Stafford Smith D.M., ..., Walker B.	Ecology: Global desertification: Building a science for dryland development	2007	Science
Wiek A., Withycombe L., Redman C.L.	Key competencies in sustainability: A reference framework for academic program development	2011	Sustainability Science
Wu J.	Landscape sustainability science: Ecosystem services and human well-being in changing landscapes	2013	Landscape Ecology
Abson D.J., Fischer J., ..., Lang D.J.	Leverage points for sustainability transformation	2017	Ambio
Stafford-Smith M., Griggs D., ..., O'Connell D.	Integration: the key to implementing the Sustainable Development Goals	2017	Sustainability Science
Bennett E.M., Cramer W., ... , Woodward G.	Linking biodiversity, ecosystem services, and human well-being: three challenges for designing research for sustainability	2015	Current Opinion in Environmental Sustainability
Sauvé S., Bernard S., Sloan P.	Environmental sciences, sustainable development and circular economy: Alternative concepts for trans-disciplinary research	2016	Environmental Development
Folke C., Biggs R., ..., Rockström J.	Social-ecological resilience and biosphere-based sustainability science	2016	Ecology and Society
Engle N.L.	Adaptive capacity and its assessment	2011	Global Environmental Change

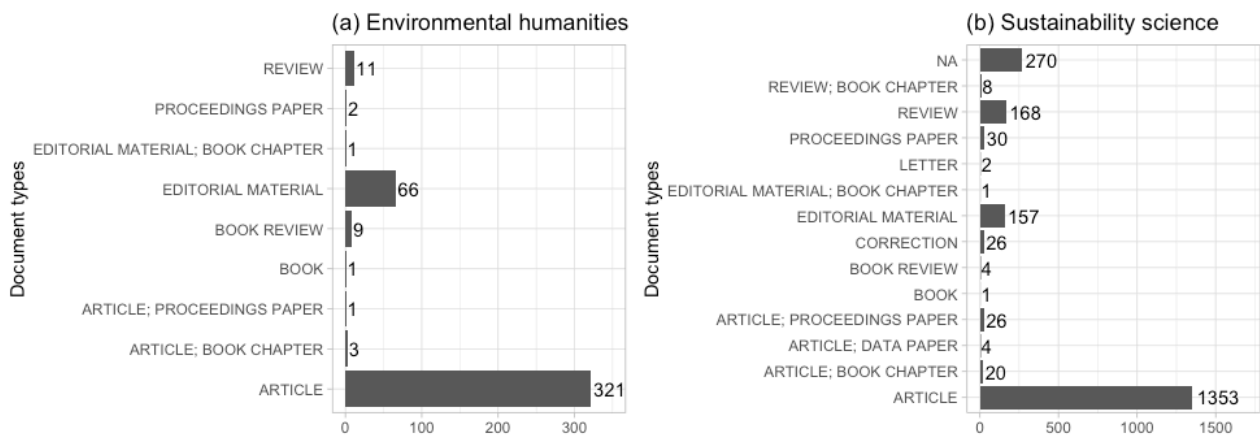


Figure S1: Distribution of the number of references indexed in WoS according to document types for (a) the EnvHum corpus, and (b) the SusSci corpus.

Table S3: Thesaurus used for keyword co-occurrence analyses, which allowed certain keywords to be merged together or ignored.

label	replace by	label	replace by
alaska		landscape planning	landscape design/planning
anthropocene societies	anthropocene	landscape sustainability	landscape sustainability
art and science	art	science	landscape sustainability
arts-based research	art	life cycle assessment	life cycle analysis
		life cycle inventory	life cycle analysis
		life cycle sustainability	
australia		assessment	life cycle analysis
biofuels	biofuel	life cycle thinking	life cycle analysis
boundary object	boundary objects	malaysia	
case study	case studies	marine protected areas	protected areas
china		media studies	media
ciencia de la sustentabilidad	sustainability science	methods	methodology
citation network	citation analysis	model	modelling
cities	urban areas	modeling	modelling
co-production	knowledge co-production	models	modelling
co-production of knowledge	knowledge co-production	narratives	narrative analysis
collaborative research	collaboration	network analysis	networks
common pool resources	common-pool resources	participatory modelling	participation
communication theory	communication	participatory research	participation
competences	competencies	planning theory	planning
complexity science	complexity	post normal science	post-normal science
conceptual framework	conceptual frameworks	practice theory	practice research
coproduction	knowledge co-production	relational ontology	relational thinking
coupled human and natural systems	social-ecological systems	research center	research centers
curriculum design	curriculum	resilience theory	resilience
design	design research	resilience thinking	resilience
design principles	design research	scenaria planning	scenario planning/analysis
design thinking	design research	scenario	scenario planning/analysis
earth system	earth system science	scenario analysis	scenario planning/analysis
earth system analysis	earth system science	scenarios	scenario planning/analysis
ecofeminism	(eco)feminism	science policy interface	science-policy interface
economic development	economic growth	science-policy	science-policy interface
economy	economics	science-policy nexus	science-policy interface
ecosystem	ecosystems	scotland	
ecosystem service	ecosystem services	smart sustainable urbanism	smart sustainable cities
educating for sustainability	education for sustainability	social science	social sciences
education for sustainable development (esd)	education for sustainable development	social-ecological	social-ecological systems
environmental	environment	social-ecological system	social-ecological systems
environmental ethics	(environmental) ethics	social-ecological systems	social-ecological systems
environmental humanities;	environmental humanities	social-ecological systems	social-ecological systems
ethics	(environmental) ethics	social-ecological systems	social-ecological systems
extinction	extinction studies	social-ecological systems	social-ecological systems
feminism	(eco)feminism	social-ecological systems	social-ecological systems
feminist environmental humanities	(eco)feminism	sustainability research	sustainability science
fisheries management	fisheries	sustainability science	sustainability science
global change science	global change	theory	sustainability science
global climate change	climate change	sustainability science;	sustainability science
		sustainability sciences	sustainability science

global environmental change	global change	sustainability transformation	sustainability transformations
greenhouse gas emissions	greenhouse	sustainability transition	sustainability transitions
higher education institutions	higher education	sustainability; sustainable development goals (sdgs)	sustainability
human-environment relations	social-ecological systems	sustainable development goals (sdgs)	SDGs
human-environment systems	social-ecological systems	sustainable development goals	SDGs
human-nature interaction	human-nature interactions	development;	sustainable development
human-nature relationships	human-nature interactions	system approach framework	system approach
human □ environment systems	social-ecological systems	systematic literature review	systematic review
human □ wildlife conflict impacts	human-wildlife conflicts	systems science	system approach
integrated assessment	integrated assessments	systems theory	system approach
integrated coastal zone management	integrated coastal management	systems thinking	system approach
interdisciplinary	interdisciplinarity	trade-off	trade-offs
interdisciplinary collaboration	interdisciplinarity	tradeoffs	trade-offs
interdisciplinary research	interdisciplinarity	transdisciplinary	transdisciplinarity
interdisciplinary studies	interdisciplinarity	transdisciplinary collaboration	transdisciplinarity
interdisciplinary study	interdisciplinarity	transdisciplinary research	transdisciplinarity
japan		transdisciplinary science	transdisciplinarity
land art	art	transformation	transformations
land change science	land change	transformational	transformative research
land sharing	land sharing/sparing	sustainability science	transformative research
land sparing	land sharing/sparing	transformative science	transformative research
land use change	land-use change	transition	transitions
landscape design	landscape design/planning	university	universities
		urban	urban areas
		urban sustainability science	urban sustainability

## 2. Supplementary results

### 2.1. Literature mapping analysis

Table S4: List of the 28 journals that contributed to both SustSci and EnvHum corpuses.

Journal name	No. of publications	
	SustSci corpus	EnvHum corpus
Accounting Auditing & Accountability Journal	1	1
AMBIO	9	3
Annals of the Association of American Geographers	2	1
Anthropocene Review	2	6
Biological Conservation	2	1
Bioscience	1	2
Climate Risk Management	1	1
Climatic Change	2	1
Conservation Biology	5	1
Environmental Communication - A Journal of Nature and Culture	4	2
Environmental Education Research	4	1
Environmental Science & Policy	23	2
Environmental Values	1	1
Futures	9	1
GAIA - Ecological Perspectives for Science and Society	53	8
Geoforum	3	1
Human Ecology	4	1
Journal of Agricultural & Environmental Ethics	3	1
Journal of Coastal Conservation	2	1
LAND	2	1
Palgrave Communications	1	1
People and Nature	4	1
Regional Environmental Change	4	1
Research Evaluation	3	1
South African Journal of Science	2	1
Transactions of the Institute of British Geographers	2	2
Urban Forestry & Urban Greening	1	1
WILEY Interdisciplinary Reviews - Climate Change	3	2
<b>Total no. of publications</b>	<b>153</b>	<b>47</b>
<i>(and percentage compared to total corpus)</i>	<i>(9.1%)</i>	<i>(11.8%)</i>



Table S5: List of the key contributing authors (and the number of their articles) in SustSci and EnvHum corpuses. For SustSci, we list the 88 authors with at least 5 publications in the corpus of 1678 publications. For EnvHum, we list the 78 authors with at least 2 publications in the corpus of 398 publications. Both author lists were established from the biblioAnalysis function of the bibliometrix package (Aria and Cuccurullo 2017). Authors appearing in both corpuses are highlighted in bold (there is only one).

SustSci corpus – Main authors		EnvHum corpus – Main authors	
Author name	No. of articles	Author name	No. of articles
Saito O	27	Sörlin S	6
Lang DJ	18	Neimanis A	5
Takeuchi K	18	Castree N	4
Wiek A	18	Hall M	4
Abson DJ	17	Hamilton JM	4
Von Wehrden H	17	Kueffer C	4
Hall DM	14	Lorimer J	4
Hashimoto S	14	Tironi M	4
Wu J	14	Adamson J	3
Fischer J	13	Blaise M	3
Hara K	12	Boast H	3
Turner BL	11	Foret P	3
Ives CD	10	Garlick B	3
Kajikawa Y	10	Kirksey E	3
Ness B	10	Maran T	3
Olsson L	10	O'Gorman E	3
Yarime M	10	Pacini-Ketchabaw V	3
Farioli F	9	Palsson G	3
Fujimori S	9	Reinert H	3
Jerneck A	9	Ryan JC	3
Matsui T	9	Salazar JF	3
McGreavy B	9	Szerszynski B	3
Plieninger T	9	Taylor A	3
Allen C	8	Twidle H	3
Caniglia G	8	Van Dooren T	3
Martin-Lopez B	8	Alaimo S	2
Riechers M	8	Armiero M	2
Sugiyama M	8	Asberg C	2
<b>Wamsler C</b>	<b>8</b>	Ballard S	2
Barth M	7	Barua M	2
Gasparatos A	7	Bastian M	2
Lindenfeld L	7	Brito C	2
Luederitz C	7	Canavan G	2
Managi S	7	Cielemecka O	2
Messerli P	7	Clark JL	2
Raymond CM	7	Clark N	2
Scholz RW	7	Despret V	2
Uwasu M	7	Ginn F	2
West S	7	Giraud E	2
Bergmann M	6	Gravagno F	2
Elmqvist T	6	Green L	2
Hanspach J	6	Heise UK	2
Heinrichs H	6	Helmreich S	2

Lam DPM	6	Hird MJ	2
Peterson GD	6	Hodgetts T	2
Phillips J	6	Hollin G	2
Saijo T	6	Houston D	2
Schaepke N	6	Jones O	2
Schneider F	6	Jorgensen D	2
Schneidewind U	6	Krzywoszynska A	2
Silka L	6	Lange T	2
Sivapalan M	6	Latour B	2
Szabo S	6	Lee HF	2
Anderson MW	5	Marchesi G	2
Bieling C	5	Mauch C	2
Cundill G	5	McGovern TH	2
Cvitanovic C	5	McLean J	2
Dasgupta R	5	Muecke S	2
Fischer M	5	Muenster U	2
Haider LJ	5	Page J	2
Hart D	5	Pei Q	2
Horlings LG	5	Pooley S	2
Kabaya K	5	Praet I	2
Kamiyama C	5	Pratt S	2
Kates RW	5	Privitera E	2
Kato E	5	Rigby K	2
Komiyama R	5	Robin L	2
Langston JD	5	Searle A	2
Leventon J	5	Shaw J	2
Liu J	5	Skrimshire S	2
Marsden T	5	Soentgen J	2
Matthews Z	5	Swanson HA	2
Metternight G	5	Symons K	2
O'Riordan T	5	Travis C	2
Olsson P	5	<b>Wamsler C</b>	<b>2</b>
Onuki M	5	Wheeler W	2
Partelow S	5	Wiedmer C	2
Pereira L	5	Zhang DD	2
Pohl C	5		
Sala S	5		
Spangenberg JH	5		
Takahashi K	5		
Tengo M	5		
Thoren H	5		
Tschakert P	5		
Van der Leeuw S	5		
Vilsmaier U	5		
Waring TM	5		
Wiedmann T	5		

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Table S6: List of the 8 references that were found to be cited by >1% of SustSci and EnvHum corpuses, including their occurrence of citation in each of the two corpuses.

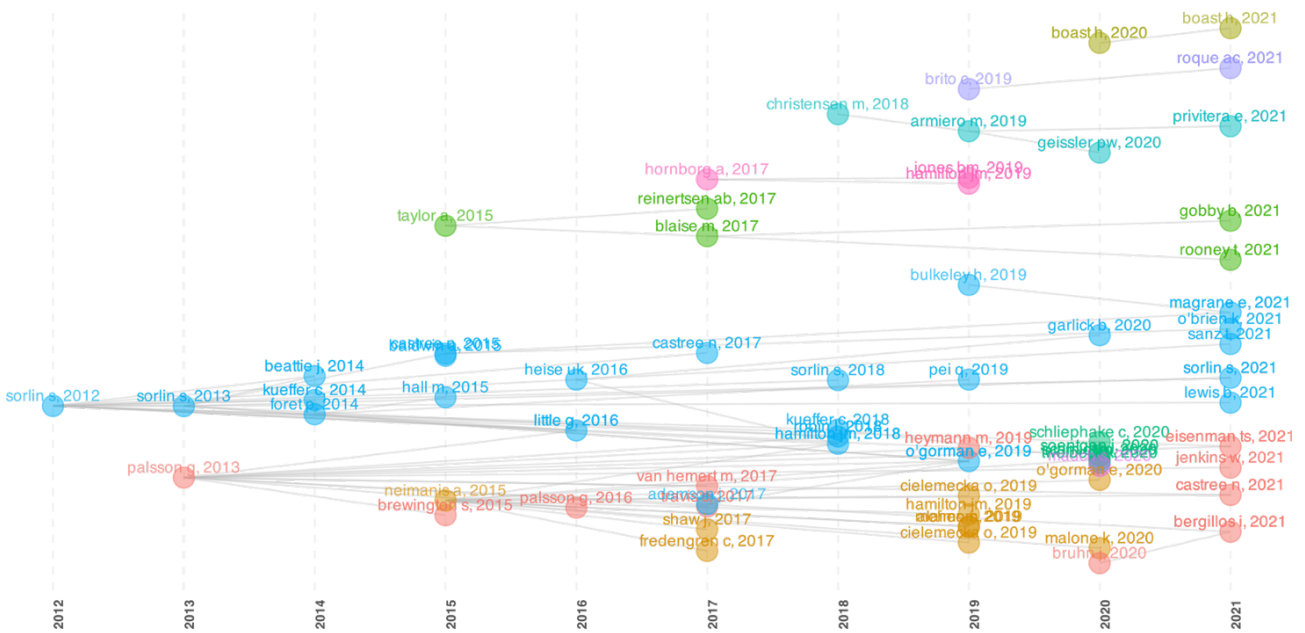
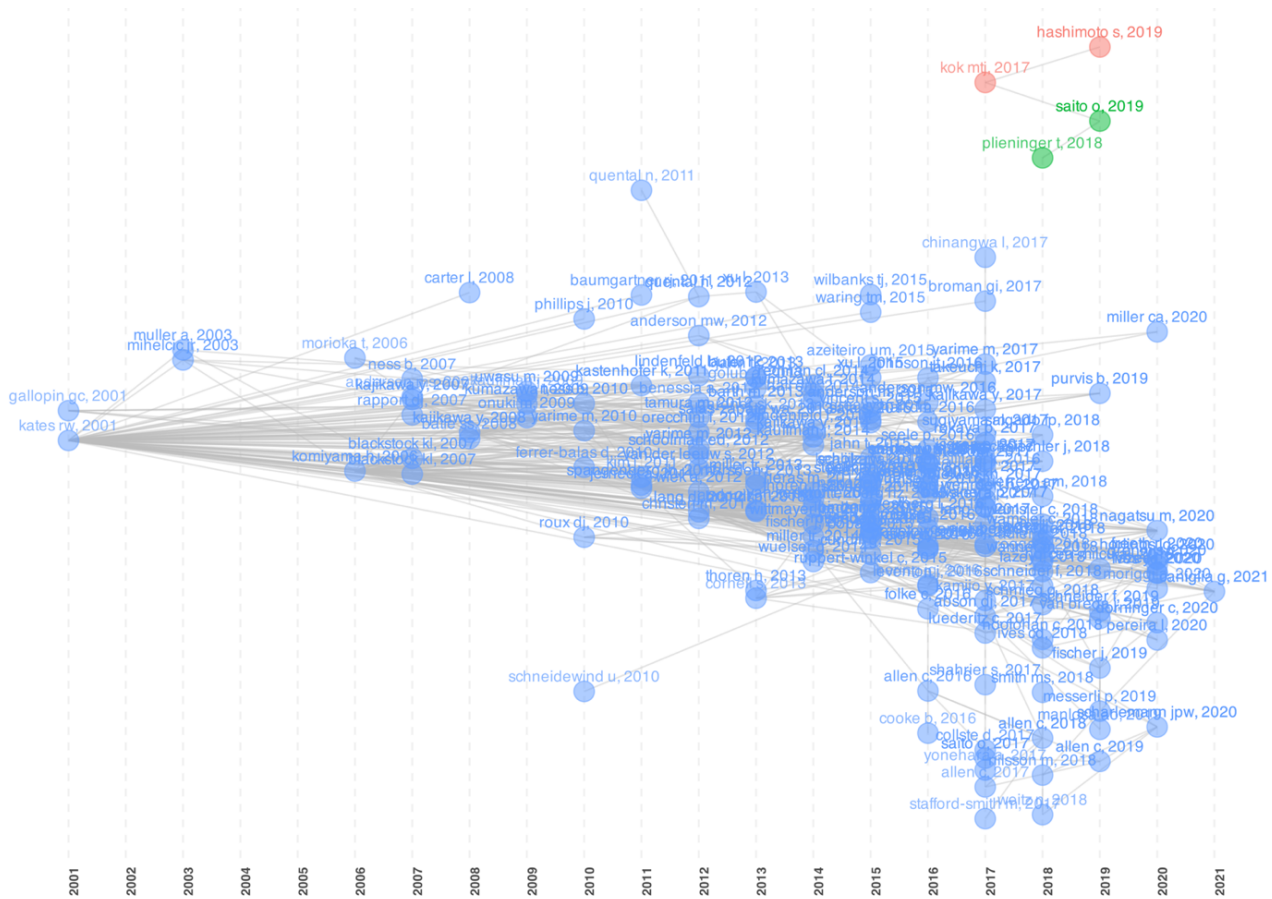
References	Times cited in SustSci corpus	Times cited in EnvHum corpus
J. Rockström, <i>et al.</i> , A safe operating space for humanity. <i>Nature</i> <b>461</b> , 472–475 (2009).	125	7
W. Steffen, <i>et al.</i> , Planetary boundaries: Guiding human development on a changing planet. <i>Science</i> <b>347</b> , 1259855 (2015).	84	4
S. L. Star, J. R. Griesemer, Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. <i>Social Studies of Science</i> <b>19</b> , 387–420 (1989).	39	5
G. Hardin, The Tragedy of the Commons. <i>Science</i> <b>162</b> , 1243–1248 (1968).	38	4
P. J. Crutzen, Geology of mankind. <i>Nature</i> <b>415</b> , 23–23 (2002).	20	16
W. Steffen, <i>et al.</i> , The Anthropocene: From Global Change to Planetary Stewardship. <i>AMBIO</i> <b>40</b> , 739–761 (2011).	20	6
W. Steffen, P. J. Crutzen, J. R. McNeill, The anthropocene: Are humans now overwhelming the great forces of nature? <i>Ambio</i> <b>36</b> , 614–621 (2007).	19	15
W. Steffen, W. Broadgate, L. Deutsch, O. Gaffney, C. Ludwig, The trajectory of the Anthropocene: The Great Acceleration. <i>The Anthropocene Review</i> <b>2</b> , 81–98 (2015).	19	8

Table S7: List of the most used keywords in the SustSci and EnvHum corpuses and number of occurrences. For SustSci, we list the 75 keywords that appear in at least 11 publications. For EnvHum, we list the 78 keywords that appear in at least 3 publications. Keywords highlighted in bold appear in both corpuses.

Rank	SustSci corpus – Main keywords		EnvHum corpus – Main keywords	
	Keyword	Occurrences	Keyword	Occurrences
1	sustainability science	338	environmental humanities	89
2	<b>sustainability</b>	<b>285</b>	anthropocene	44
3	<b>transdisciplinarity</b>	<b>149</b>	<b>climate change</b>	<b>23</b>
4	sustainable development	97	<b>environment</b>	<b>23</b>
5	social-ecological systems	94	multispecies	21
6	<b>climate change</b>	<b>82</b>	humanities	19
7	science	60	ecocriticism	18
8	resilience	58	extinction studies	18
9	ecosystem services	56	<b>(environmental) ethics</b>	<b>15</b>
10	SDGs	55	art	11
11	transformations	54	(eco)feminism	9
12	<b>interdisciplinarity</b>	<b>52</b>	colonialism	9
13	adaptation	34	environmental history	9
14	knowledge co-production	34	posthumanism	8
15	development	33	ecology	7
16	sustainable	32	care	6
17	<b>environment</b>	<b>28</b>	climate	6
18	<b>knowledge</b>	<b>27</b>	environmental justice	6
19	participation	27	environmentalism	6
20	<b>biodiversity</b>	<b>26</b>	studies	6
21	governance	26	<b>sustainability</b>	<b>6</b>
22	scenario planning/analysis	25	affect	5
23	vulnerability	24	deep time	5
24	methodology	23	<b>global change</b>	<b>5</b>
25	policy	23	literature	5
26	research	23	poetry	5
27	higher education	22	slow violence	5
28	sustainability transitions	21	<b>transdisciplinarity</b>	<b>5</b>
29	urban areas	20	animal studies	4
30	evaluation	19	blue humanities	4
31	social	19	<b>conservation</b>	<b>4</b>
32	transitions	19	environmental social science	4
33	science–policy interface	18	geology	4
34	communication	17	history	4
35	sustainability education	17	indigenous	4
36	systems	17	<b>interdisciplinarity</b>	<b>4</b>
37	anthropocene	16	<b>knowledge</b>	<b>4</b>
38	change	16	<b>landscape</b>	<b>4</b>
39	<b>conservation</b>	<b>16</b>	migration	4
40	management	16	multispecies ethnography	4
41	<b>(environmental) ethics</b>	<b>15</b>	new materialism	4
42	<b>agriculture</b>	<b>15</b>	plants	4
43	analysis	15	politics	4
44	complexity	15	storytelling	4
45	education	15	toxicity	4
46	<b>landscape</b>	<b>15</b>	water	4

47	landscape sustainability	15	agency	3
48	design research	14	<b>agriculture</b>	<b>3</b>
49	epistemology	14	anthropology	3
50	human well-being	14	<b>biodiversity</b>	<b>3</b>
51	indicators	14	biosemiotics	3
52	institutions	14	capitalism	3
53	learning	14	<b>climate change</b>	<b>3</b>
54	leverage points	14	cosmopolitics	3
55	networks	14	ecological	3
56	values	14	ecological humanities	3
57	adaptive capacity	13	enchantment	3
58	assessment	13	energy humanities	3
59	collaboration	13	<b>environmental ethics</b>	<b>3</b>
60	<b>global change</b>	<b>13</b>	ethnography	3
61	2030 agenda	12	gender	3
62	covid-19	12	haunting	3
63	ecosystems	12	heritage	3
64	food security	12	infrastructure	3
65	lifecycle analysis	12	interspecies communication	3
66	social learning	12	invasive species	3
67	sustainability assessment	12	materiality	3
68	system approach	12	media	3
69	blue economy	11	ocean	3
70	citizen science	11	oil	3
71	engagement	11	political ecology	3
72	fisheries	11	pollution	3
73	innovation	11	queer theory	3
74	trade-offs	11	science	3
75	urban planning	11	synthetic biology	3
76			violence	3
77			weather	3
78			world literature	3

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## 2.2. Lexical analysis

Table S8: The five lexical classes identified by the DHCA, with the number and proportion of abstracts per category.

Class	No. of abstracts within class	Total no. of abstracts retained by DHCA	Proportion of abstracts in class (in %)
1	303	1324	22.89
2	204	1324	15.41
3	295	1324	22.28
4	287	1324	21.68
5	235	1324	17.75
<b>Total</b>	<b>1324</b>	<b>1324</b>	<b>100</b>

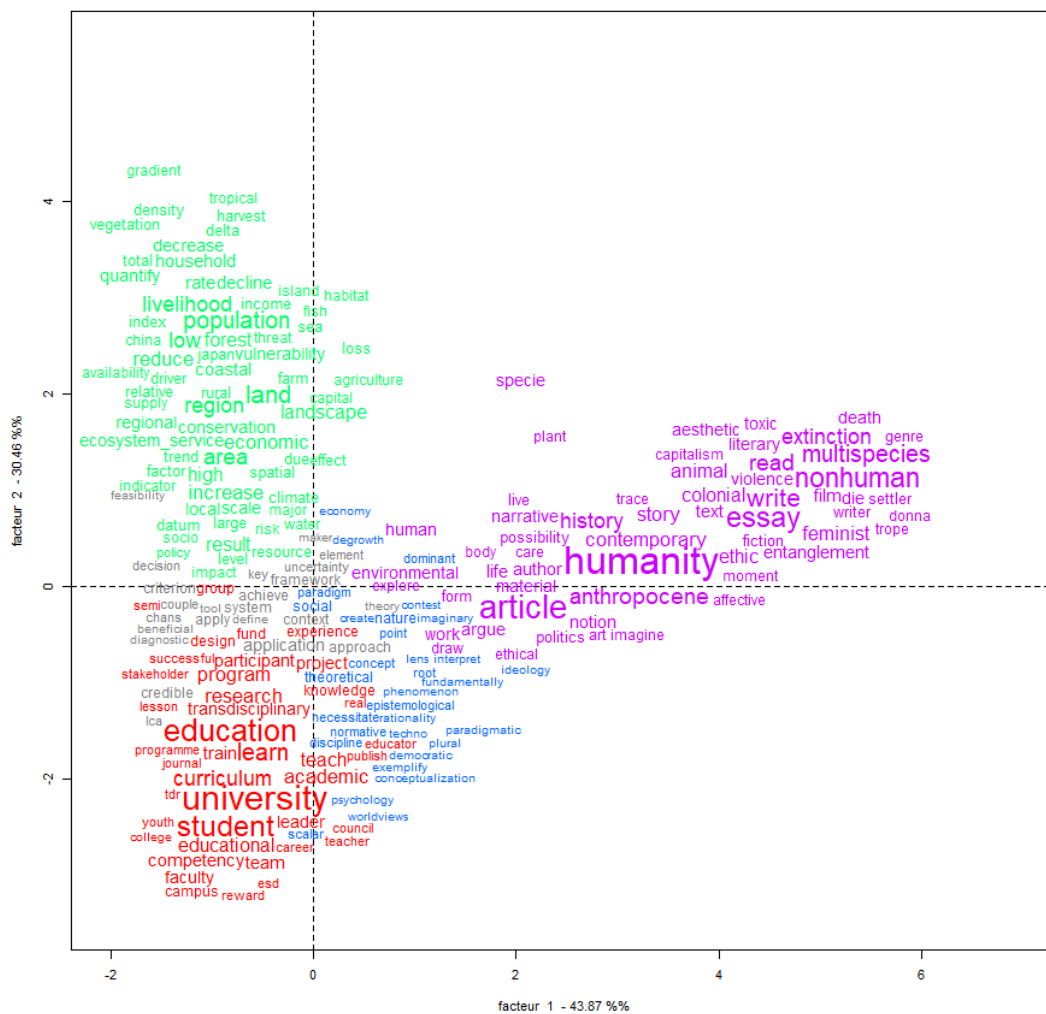


Figure S4: First factorial plane of the correspondence analysis applied to the entire literature corpus (pooling EnvHum and SustSci) after the outputs of the Reinert analysis. The 30 most characteristic terms of each class are represented; the font size is proportional to chi-square statistics.

- Class 1: Transdisciplinarity and education

Of the 303 texts in this class, 291 were from the SustSci corpus; a chi-square test confirmed the association of class 1 to the SustSci corpus ( $p < 0.0001$ ; Table S5). Terms such as [university], [education], [student],

[*academic*], [*program*], [*educational*], [*competency*], [*graduate*] were highly characteristic of the class (all  $p < 0.0001$ ). The term [*interdisciplinarity*] was also very frequent and associated with class 1 ( $freq=40/114$ ;  $p=0.00117$ ), but [*transdisciplinary*] was even more central ( $freq=77/164$ ;  $p < 0.0001$ ). The term [*sustainability\_science*] was also highly characteristic ( $freq=130/430$ ;  $p < 0.0001$ ).

- *Class 2: Systemic understanding for operational solutions*

Of the 204 texts in this class, 202 were from the SustSci corpus, with a strong association ( $p < 0.0001$ ). As with class 1, the term [*sustainability\_science*] was statistically associated with class 2 ( $freq=94/436$ ;  $p < 0.0001$ ). In particular, this class was characterized by terms such as [*complex*] ( $freq=54/184$ ;  $p < 0.0001$ ) and [*complexity*] ( $freq=33/101$ ;  $p < 0.0001$ ), as well as [*system*] ( $freq=101/406$ ;  $p < 0.0001$ ) and [*socio\_ecological\_system*] ( $freq=34/102$ ;  $p < 0.0001$ ).

- *Class 3: Reconciling social, economic and environmental challenges*

Of the 295 texts in this class, 287 were from SustSci, with a significant association ( $p < 0.0001$ ). The most characteristic terms indicated a focus on real-world challenges regarding land and landscapes, populations and livelihoods, socio-economic issues and biodiversity conservation (Table S5). Ecological economy was central in this class, as shown by its frequent use of the terms [*economic*] ( $freq=102/214$ ;  $p < 0.0001$ ) and [*payment\_for\_environmental\_service*] ( $freq=6/7$ ;  $p < 0.0001$ ).

Class 3 reflects the discourse of ecological economics, which aims to reconcile socio-economic and environmental challenges by focusing on market instruments and human activities that could contribute to this end. This discourse is also closely aligned with landscape ecology and conservation biology, and with the concept of ecosystem services ( $freq=48/84$ ;  $p < 0.0001$ ), a boundary concept between these disciplines and approaches. Interestingly, this class was also characterized by the absence of the terms [*transdisciplinary*] ( $freq=8/164$ ;  $p < 0.0001$ ) and [*interdisciplinary*] ( $freq=2/114$ ;  $p=0.0016$ ).

- *Class 4: Theoretical and epistemological considerations*

Of the 287 texts in this class, 269 were from the SustSci corpus, with high association ( $p < 0.0001$ ). The terms [*theoretical*] ( $freq=51/113$ ), [*concept*] ( $freq=80/233$ ), [*paradigm*] ( $freq=31/65$ ), [*perspective*] ( $freq=79/235$ ), [*epistemological*] ( $freq=14/23$ ), and [*philosophical*] ( $freq=10/17$ ) were particularly characteristic of class 4 (all  $p < 0.0002$ ).

Class 4 depicted a theoretical, ontological and philosophical discourse developed in SustSci, with a clear influence of concepts from the social sciences (Table S6).

- *Class 5: Humanities and the environment*

Class 5 was significantly associated with the EnvHum corpus ( $p < 0.0001$ ): of the 235 texts in this class, 226 were from the EnvHum corpus (there were a total of 269 classified texts in the EnvHum corpus). Humankind is frequently cited, with [*humanity*] ( $freq=101/157$ ), [*human*] ( $freq=118/393$ ), and [*Anthropocene*] ( $freq=48/75$ ) all characteristic terms in the class (all  $p < 0.0001$ ). The discourse also showed an interest in power,



domination and subaltern studies, with terms referring to gender and sexual identity ([*queer*], [*feminist*], [*feminism*]) or racial issues ([*colonial*], [*white*]). An emphasis on nonhumans was also evidenced by the terms [*nonhuman*], [*multispecies*], [*extinction*] or [*animal*], all characteristic of the class (Table S5). Narrative aspects were also a focus, with terms such as [*film*] (*freq*=14/14), [*literary*] (*freq*=17/20), [*text*] (*freq*=24/32), [*write*] (*freq*=35/39), etc. The political dimension was shown in activist engagement with terms such as [*critique*] (*freq*=18/29), [*resistance*] (*freq*=13/17), and [*activist*] (*freq*=13/20) (all  $p < 0.0001$ ).

Conversely, class 5 had an absence of certain terms such as [*interdisciplinary*] (*freq*=8/114) and [*transdisciplinary*] (*freq*=2/164), [*sustainability*] (*freq*=5/558) and [*sustainable*] (*freq*=8/389). Likewise, many terms relating to environmental governance were absent, including [*management*] (*freq*=10/279), [*stakeholder*] (*freq*=1/190), [*decision*] (*freq*=2/194), [*policy*] (*freq*=6/285), and [*governance*] (*freq*=5/125).

The isolation of a lexical class specific to EnvHum denotes both a semantic difference between the two fields (referring to similar things but with different words) as well as a difference in research interests, in particular EnvHum's lower interest in engaging in environmental governance issues.

*Table S9: Most frequent terms in the five identified lexical classes. Only the 30 most characteristic terms are presented for each class, including their relative frequency and the outputs of chi-square tests.*

<b>Class 1: Transdisciplinarity and education</b>			
<b>Term</b>	<b>Relative freq.</b>	<b>Chi-square</b>	<b>p value</b>
university	82/96	229.33	8.33488E-52
education	90/122	197.17	8.66856E-45
student	57/64	166.89	3.54045E-38
learn	108/199	130.73	2.83801E-30
curriculum	32/33	105.25	1.0745E-24
academic	63/101	96.62	8.38009E-23
program	66/112	90.07	2.30322E-21
research	208/596	88.65	4.70422E-21
teach	36/45	86.11	1.70519E-20
educational	33/41	79.55	4.7031E-19
participant	52/85	75.46	3.72031E-18
train	29/35	73.27	1.13259E-17
competency	22/23	70.23	5.28117E-17
team	30/39	66.49	3.51746E-16
graduate	20/21	63.3	1.77785E-15
faculty	18/18	61.49	4.45128E-15
transdisciplinary	77/164	61.43	4.58451E-15
project	102/244	60.66	6.77698E-15
leader	24/29	60.23	8.45201E-15
skill	30/42	57.92	2.73215E-14
professional	23/29	53.49	2.59967E-13
sustainability	182/558	51.75	6.29161E-13
partner	20/24	50.61	1.12717E-12
leadership	21/26	50.35	1.28536E-12
foster	47/90	47.09	6.77017E-12
collaboration	54/111	45.57	1.47384E-11
experience	74/175	43.01	5.45413E-11
knowledge	130/372	42.65	6.56221E-11

researcher	66/152	41.03	1.49652E-10
fund	30/52	37.16	1.08957E-09
<i>*SustSci_corpus</i>	<i>291/1058</i>	<i>63.68</i>	<i>1.4645E-15</i>

### Class 2: Systemic understanding for operational solutions

Term	Relative freq.	Chi-square	p value
application	46/111	63	2.06624E-15
system	101/406	40.28	2.19871E-10
context	81/301	39.54	3.20656E-10
knowledge	94/372	38.6	5.20828E-10
achieve	44/132	36.15	1.83115E-09
framework	82/316	35.39	2.70235E-09
apply	50/161	34.43	4.41049E-09
credible	10/14	34.07	5.31696E-09
review	39/115	33.09	8.80675E-09
intend	20/43	32.99	9.27104E-09
criterion	22/50	32.59	1.13687E-08
relevant	39/116	32.36	1.28325E-08
approach	123/560	32.01	1.53616E-08
complex	54/184	31.86	1.65652E-08
causal	11/18	29.24	6.38078E-08
socio_ecological_system	34/102	27.24	1.79241E-07
element	31/90	26.85	2.20035E-07
process	93/401	26.74	2.32597E-07
couple	22/56	25.58	4.24743E-07
propose	58/217	25.52	4.38359E-07
complexity	33/101	25.01	5.71174E-07
deliver	11/20	24.42	7.73687E-07
inform	33/103	23.7	1.12504E-06
dynamic	45/158	23.53	1.23282E-06
enhance	31/95	23.29	1.39043E-06
paper	92/408	23.07	1.55903E-06
decision	52/194	22.65	1.9438E-06
uncertainty	20/52	22.07	2.62815E-06
LCA	4/4	22.03	2.68795E-06
key	64/258	21.72	3.16132E-06
<i>*SustSci_corpus</i>	<i>202/1058</i>	<i>54.86</i>	<i>1.2955E-13</i>

### Class 3: Reconciling social, economic and environmental challenges

Term	Relative freq.	Chi-square	p value
land	98/173	135.73	2.2894E-31
population	62/87	129.03	6.69683E-30
area	107/210	118.48	1.35861E-27
region	78/135	109.38	1.33648E-25
low	51/70	109.17	1.48651E-25
livelihood	43/56	100.31	1.30017E-23
reduce	50/73	95.28	1.65213E-22
economic	101/214	91.51	1.11256E-21
increase	106/233	87.98	6.59764E-21
forest	45/65	87.01	1.07837E-20
high	80/156	85.89	1.90339E-20
landscape	84/169	84.13	4.62567E-20
result	147/388	77.19	1.555E-18
coastal	43/66	73.72	8.98473E-18

decline	32/42	72.8	1.43633E-17
ecosystem	69/138	68.36	1.36484E-16
household	25/30	66.07	4.34711E-16
rate	28/36	65.82	4.94371E-16
scale	103/249	64.5	9.63936E-16
conservation	59/113	63.92	1.29781E-15
ecosystem_service	48/84	62.95	2.12173E-15
quantify	24/29	62.62	2.50115E-15
local	94/223	61.15	5.2854E-15
vulnerability	37/58	60.36	7.88807E-15
decrease	22/26	59.51	1.2175E-14
regional	51/95	58.28	2.26913E-14
datum	77/177	53.14	3.10957E-13
rural	35/57	52.65	3.9909E-13
spatial	53/105	52.36	4.63073E-13
agricultural	38/65	51.67	6.55527E-13
<b>*SustSci_corpus</b>	<b>287/1058</b>	<b>71.41</b>	<b>2.90625E-17</b>

#### **Class 4: Theoretical and epistemological considerations**

<b>Term</b>	<b>Relative freq.</b>	<b>Chi-square</b>	<b>p value</b>
sustainability	179/558	61.47	4.499E-15
theoretical	51/113	40.04	2.49383E-10
sustainability_science	138/436	38.1	6.73728E-10
economics	21/32	37.31	1.00994E-09
fundamental	35/70	34.92	3.43305E-09
social	148/489	33.69	6.45776E-09
nature	69/183	32.13	1.44048E-08
foundation	30/59	30.95	2.64777E-08
necessitate	12/15	30.4	3.51973E-08
discipline	53/131	30.21	3.88628E-08
normative	28/54	30.19	3.9133E-08
scalar	8/8	29.08	6.93914E-08
principle	43/100	28.97	7.35568E-08
concept	81/233	28.53	9.24869E-08
agenda	29/59	27.46	1.60561E-07
paradigm	31/65	27.25	1.78827E-07
point	50/127	25.9	3.59205E-07
contribution	45/111	25.39	4.6747E-07
conceptual	47/119	24.45	7.61433E-07
transformation	51/133	24.2	8.6949E-07
perspective	79/235	23.99	9.67197E-07
dominant	23/45	23.77	1.08482E-06
root	20/37	23.5	1.24772E-06
transformative	30/67	22.18	2.48365E-06
problem	91/288	21.34	3.85535E-06
epistemological	14/23	21.18	4.18732E-06
democratic	7/8	20.54	5.84042E-06
fundamentally	13/21	20.34	6.48554E-06
rationality	8/10	20.19	7.01948E-06
phenomenon	18/34	20.09	7.38572E-06
<b>*SustSci_corpus</b>	<b>269/1058</b>	<b>43.59</b>	<b>4.05793E-11</b>

#### **Class 5: Humanities and the environment**

<b>Term</b>	<b>Relative freq.</b>	<b>Chi-square</b>	<b>p value</b>
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humanity	101/157	264.75	1.58347E-59
article	143/316	215.07	1.07486E-48
essay	44/52	165.77	6.22095E-38
nonhuman	33/33	156.83	5.56903E-36
write	35/39	142.67	6.94752E-33
multispecies	26/26	122.9	1.46767E-28
read	31/36	118.46	1.37292E-27
Anthropocene	48/75	116.49	3.70441E-27
extinction	27/30	109.76	1.10661E-25
history	52/90	105.98	7.43824E-25
story	35/51	94.05	3.07157E-22
animal	29/38	91.92	9.0252E-22
feminist	22/24	91.48	1.12683E-21
contemporary	42/70	90.37	1.97261E-21
ethic	27/37	79.51	4.78854E-19
colonial	23/29	76.97	1.73766E-18
text	24/32	73.62	9.4519E-18
notion	35/60	70.91	3.74626E-17
entanglement	18/21	67.52	2.0886E-16
film	14/14	65.57	5.6088E-16
author	40/77	65.5	5.82337E-16
life	60/142	65.42	6.04647E-16
death	15/16	64.08	1.19524E-15
violence	19/24	63.16	1.90901E-15
literary	17/20	62.91	2.16446E-15
die	13/13	60.84	6.19096E-15
specie	39/77	60.62	6.93689E-15
work	94/281	60.25	8.36457E-15
toxic	15/17	58.61	1.92551E-14
narrative	42/88	58.03	2.58397E-14
<b>*EnvHum_corpus</b>		<b>1030.08</b>	<b>5.1891E-226</b>

### 2.3. Checking for result robustness

In order to assess to what extent our results were depended on the scope of WoS, in particular in light of its less effective coverage of social science literature, we reprocessed our analyses based on corpuses gathered from the Scopus database with the same search strings (submitted on 24 July 2023). For this robustness check, we used on all the references found in Scopus, including books and book chapters.

First, Scopus contained a larger number of publications in both SustSci and EnvHum. After the pre-processing steps described in the main text ‘Methods’ section, we identified with Scopus 3581 references in SustSci and 777 references in EnvHum, basically due to a larger coverage of journals and a better indexing of books and book chapter (Figure S5). Second, despite this different literature coverage, our key findings based on WoS literature were confirmed with Scopus literature, as illustrated through the following figures.

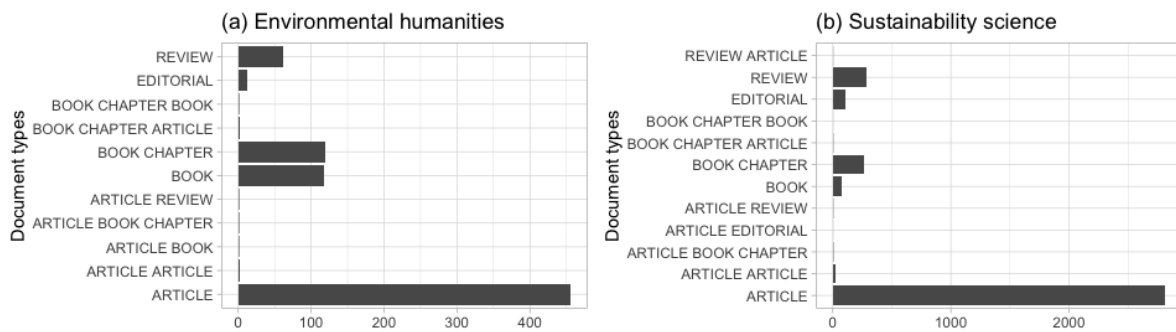


Figure S5: Distribution of the number of references indexed in Scopus according to document types for (a) the EnvHum corpus, and (b) the SusSci corpus.

As shown in Fig. S6, the temporal dynamic of the two fields evidenced with Scopus were quite similar as the one evidenced with WoS.

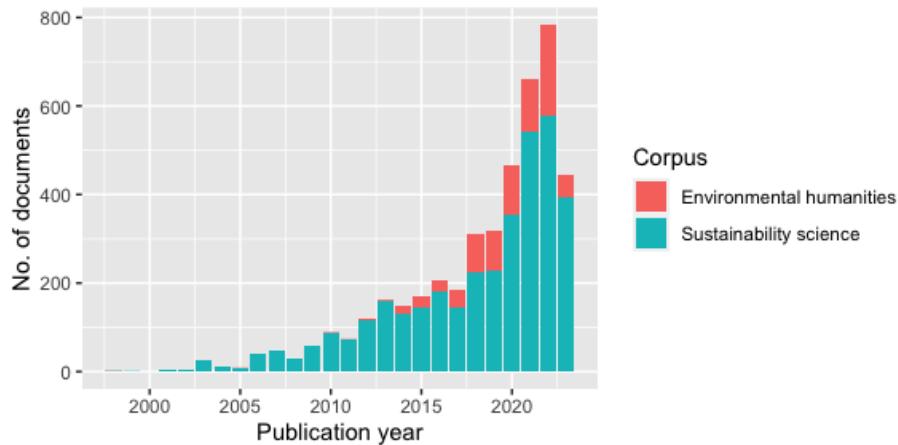


Figure S6: Number of documents published between 1998 (publication year of the first document found) and 2023 in SutSci and EnvHum and indexed in Scopus.

As shown in Fig. S7, Scopus also evidenced a limited overlap between SustSci and EnvHum in terms of contributing journals, confirming the place of GAIA as a key contributor to both fields. Similarly, the results found in WoS about contributing authors and publication practices were also supported with Scopus-based analyses. This is here illustrated in Fig. S8 showing that the top 20 authors are different between the two fields and that individual production of indexed publications is lower for EnvHum scholars than for SustSci scholars.

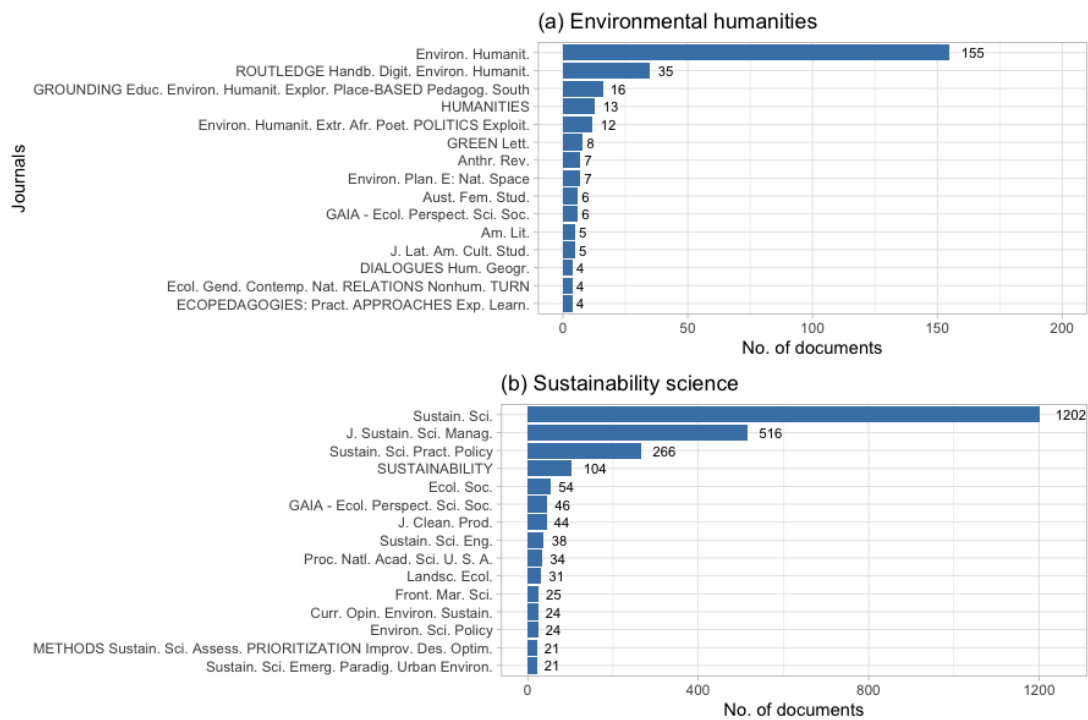


Figure S7: Number of documents indexed in Scopus published between 1998 (publication year of the first document found) and 2023 in (a) EnvHum and (b) SutSci.

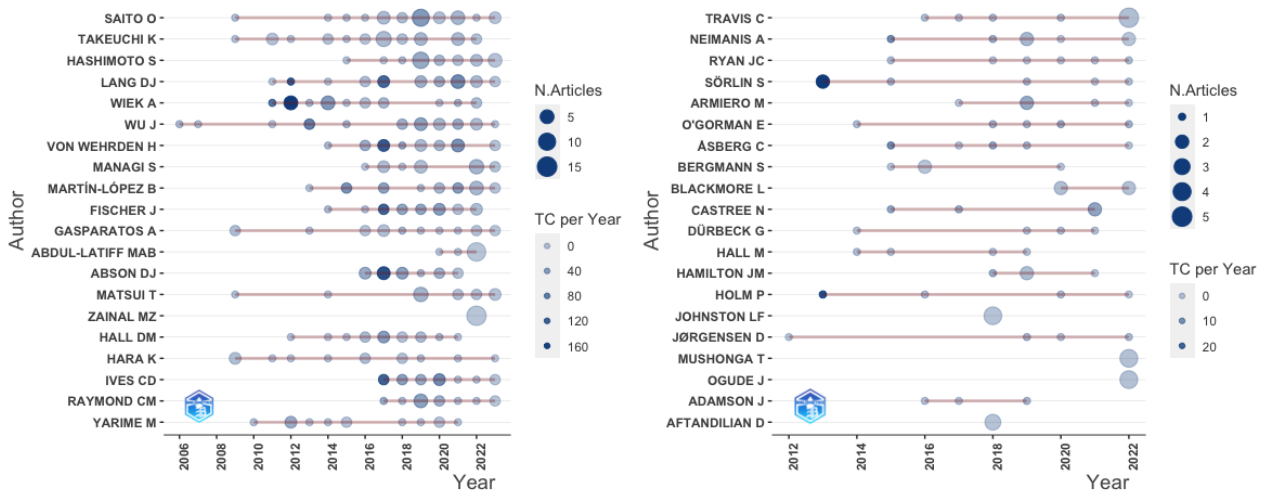


Figure S8: Top 20 authors and their scientific publications over time based on Scopus database in SustSci (left panel) and EnvHum (right panel). Size of the circles indicates the number of an author's publications; the colour indicates the number of times authors were cited.

Finally, keyword co-occurrence analyses based on Scopus literature resulted in similar word clouds as those obtained with WoS (Figs S9 and S10). As a consequence, the key gaps and overlaps found based on WoS literature were also found based on Scopus literature, confirming the robustness of our main findings and conclusions.



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