

Scientometric Study of Ecological Awareness and Moral Commitment in Water Use in the Fields of Social and Economic Sciences

Ángel Acevedo-Duque

GRUPO DE INVESTIGACIÓN DE ESTUDIOS ORGANIZACIONALES SOSTENIBLES,
UNIVERSIDAD AUTÓNOMA DE CHILE; ANGEL.ACEVEDO@UAUTONOMA.CL

Jessica Müller-Pérez

GRADUATE DEPARTMENT, SCHOOL OF MARKETING AND BUSINESS, UNIVERSIDAD
POPULAR AUTÓNOMA DEL ESTADO DE PUEBLA, BARRIO DE SANTIAGO, PUEBLA; JESSICA.
JESSICA.MULLER@UPAEP.MX

Abstract

his article aims to analyze the collaboration between authors in the fields of moral commitment and ecological awareness in water use within scientific production in social and economic sciences from 1976 to 2023. The study employed a scientometric approach, reviewing a total of 736 articles in the Web of Science (WoS) related to ecological awareness and 912 in Scopus. Additionally, 412 articles in WoS and 880 in Scopus focused on moral commitment were examined. This analysis revealed significant literary connections between both categories in the explored fields of knowledge. The search was conducted in three key periods: March 2021, January 2022, and November 2023. The data was exclusively obtained from the Web of Science (SCI-EXPANDED or SSCI) and Scopus, focusing on the areas of “Business, Management and Accounting,” “Economics, Econometrics and Finance,” “Decision

Sciences,” and “Multidisciplinary.” Bibliometric analyses were applied through the Law of Exponential Growth (PRICE), the Law of Aging or Obsolescence of Scientific Literature (PRICE), the Law of Author Productivity (LOTKA), the Law of Scientific Literature Dispersion (BRADFORD), and the Linguistic Law or Disciplines with Standard Distribution (ZIPF) to identify trends and collaborations, using tools like Vosviewer to visualize spatial patterns, co-authorship, and keyword co-occurrence. The main findings focus on the 45 prolific authors in moral commitment, organized into 11 collaboration clusters, and 52 authors in ecological awareness with similar connections. However, a lack of inter-cluster connections was observed, suggesting a geographical focus in the research. The most frequent keywords were analyzed, revealing seven thematic clusters in each area, such as business ethics and climate change, highlighting the interrelationship between ethics, leadership, and sustainability.

Keywords: Ecological awareness, moral commitment, scientometrics, academic collaboration, scientific productivity, knowledge management.

1. Introduction

In the contemporary academic field, research on moral commitment and ecological awareness in relation to water use has gained significant relevance due to the growing concern for environmental sustainability and ethics in business and management practices (1). These two interrelated fields, although distinct in their approach, share the common goal of promoting responsible behaviors toward natural and social resources. However, the way these issues are addressed within the social and economic sciences presents unique challenges and opportunities that require detailed analysis and a deep understanding (2).

The categorization of studies on moral commitment and ecological awareness in water use faces the diversity of theoretical and methodological approaches employed by researchers to address these topics (3). From ethical perspectives to economic and management analyses, there is a variety of conceptual frameworks that influence how these phenomena are conceptualized and studied in the academic literature, but there is still a broad interest in understanding how they converge. This diversity not only enriches the field but also presents

challenges in terms of integration and comparability of findings between studies (4).

The problem of categorization also lies in the fragmentation and dispersion of the scientific literature on these topics. Despite the growth in the number of studies, the connection between different subfields and disciplines within the social and economic sciences is often limited (5). This can make it difficult to build an integrated knowledge framework that addresses the ethical and environmental issues related to water holistically.

Furthermore, the temporality of studies and the evolution of theoretical and practical perspectives over time pose challenges for synthesizing and extrapolating results (6). Research on moral commitment and ecological awareness in water use from 1976 to 2023 reflects significant changes in the understanding and application of these concepts, which requires a critical assessment of how they have evolved and how these lessons can be applied to the contemporary context.

This led to the formulation of the following research question: How can the different theoretical approaches in research on ecological awareness and moral commitment in water use within social and economic sciences be integrated to develop a coherent and globally applicable knowledge framework? The concentration of studies in certain scientific bases may limit the global applicability of the findings and bias perspectives on the challenges and solutions related to water use (7). This disparity in regional representation highlights the need for comparative and collaborative studies like this one, which expand the knowledge base and foster a more global understanding of the issues at hand.

For this reason, the study proposes as its goal to analyze collaboration among authors in the fields of moral commitment and ecological awareness in water use within scientific production in social and economic sciences. From a methodological standpoint, a qualitative approach was used through scientometric analysis. This qualitative approach, which explores individual perceptions and behaviors, could influence the interpretation and comparison of results, leading to the construction of a coherent and robust knowledge base.

Together, these challenges and opportunities underscore the importance of a detailed and critical analysis of the existing literature on moral commitment and ecological awareness in water use in social and economic sciences (8). This problem statement seeks to address these complexities in order to advance understanding and the sustainable management of our water resources in an ever-changing global context.

2. Theoretical Framework

2.1. Environmental Awareness from Literary Findings.

Environmental awareness refers to individuals' understanding and sensitivity to environmental issues and their willingness to take actions to mitigate them (9). This awareness involves a deep understanding of global and local environmental challenges, such as climate change, biodiversity loss, air and water pollution, among others. Furthermore, environmental awareness, in terms of water conservation, implies understanding how our individual and collective actions impact this vital resource today and for future generations (8). Individuals with high environmental awareness tend to adopt more sustainable behaviors in their daily lives, such as reducing energy consumption, using public transport or bicycles, and minimizing waste.

2.2. Moral Commitment from Literary Findings.

Moral commitment refers to individuals' willingness to act ethically and responsibly, even when there are no external incentives to do so (10). This commitment is based on deep-rooted personal principles and values that guide a person's decisions and actions in ethically complex situations. Moral commitment involves a profound connection with principles of justice, fairness, and respect for others and the environment, and it is manifested through altruistic and prosocial behaviors, as well as resistance to the temptation to act contrary to ethical values (11).

From this perspective, it is influenced by various factors, including upbringing, education, religion, and personal experiences. Social justice theory and moral development theory provide conceptual frameworks to understand how moral commitment forms and manifests over time (12). Moreover, research has shown that individuals with high moral commitment tend to have better mental health and overall well-being, and in an increasingly complex and diverse world, moral commitment plays a key role in promoting ethical behaviors and building fairer and more sustainable societies.

3. Materials and Methods

This study used a qualitative review approach to examine the relationships between ecological awareness and moral commitment in social and economic sciences. The search was conducted in three key periods: March 2021, January 2022, and November 2023 (13). The data used in this study were obtained through Web of Science (WoS) and Scopus, focusing on the keywords “Ecological Awareness and Moral Commitment, Water” in the scientific productivity areas “Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences, and Multidisciplinary.” Subsequently, a scientometric analysis was performed.

From a methodological perspective, a bibliometric approach was used to conduct a review on the relationship between the study variables (14). The data for this study were obtained through Web of Science (WoS) and Scopus using the following search strings: TS= (Ecological awareness /0 Ecological awareness) Refined By: Web of Science Index: Science Citation Index Expanded (SCI-EXPANDED) or Social Sciences Citation Index (SSCI), followed by a bibliometric analysis.

The information was addressed inductively, meaning there was no predefined guide or analysis categories to provide step-by-step guidance. When generating data through Vosviewer, it was immediately identified that the thematic focus would revolve around the concepts of Ecological Awareness and Moral Commitment to Water. By exclusively using the WoS and Scopus indexing database, information from other databases that are not comparable in terms of citations was excluded, as several studies indicate that the results

of systematic literature reviews can vary depending on the database used. The search was conducted on May 27, 2024 (14).

For the study of scientific production, Price's Law was used to evaluate the annual exponential growth of published documents, based on the adjusted determination coefficient (R^2) of the trendline using Microsoft Excel (Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., . . . Upadhyay, N., 2020). Similarly, it was used to corroborate whether there is scientific community interest in advancing research on a topic. Applying Lotka's Law to authors was used to identify the most prolific authors and study them separately from other authors with fewer articles, based on the unequal distribution of scientific production among authors (15).

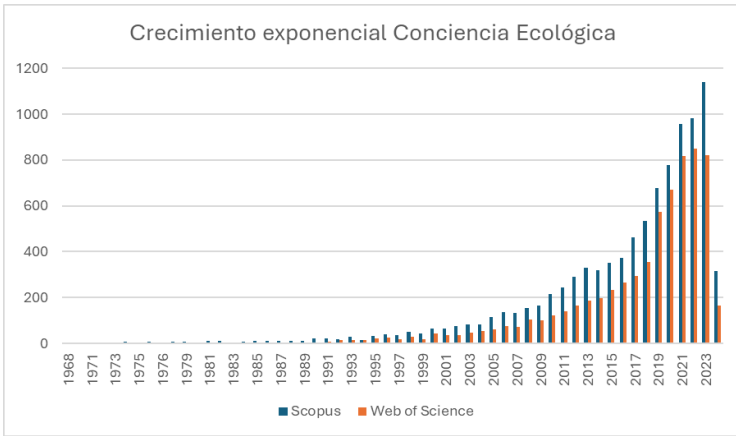
To observe how some documents in this set form the basis for creating new knowledge (subsequent documents), the Hirsch index (h-index) was employed, which specifies a set of "n" documents with "n" or more citations (Eckert, M., Volmerg, J. S., & Friedrich, C. M., 2019). Finally, for the analysis of scientific production areas, Zipf's Law was used to determine the most commonly used keywords in a document set, estimated using the square root of the total number of keywords, with complementary adjustments based on power law, which can be verified with the determination coefficient (R^2) (16)

The processing of information and the visualization of spatiality, co-authorship, co-occurrence, countries, and keywords were analyzed using Vosviewer software, employing fragmentation analysis for the visualization of temporal and thematic trends (17).

4. Results

Between 1976 and 2023, a total of 9,418 articles on Ecological Awareness (EA) were published in WoS and 6,655 in Scopus. However, scientific production decreased when applying search criteria focused on social and economic sciences "Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences, and Multidisciplinary" (See Figure 1).

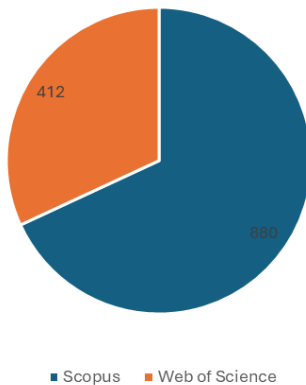
Figure 1: Exponential Growth of Ecological Awareness



Source: *Exponential Growth of Ecological Awareness, own elaboration.*

Subsequently, a scientometric analysis by decade reveals that it is in the last three decades where there has been a significant increase in publications on this topic, with the mid-2000s seeing the highest flow of information, showing an R2 of approximately 81%. Therefore, studies on the concept of Ecological Awareness (EA) presented a considerable number of research articles, with 880 in WoS and 412 in Scopus.

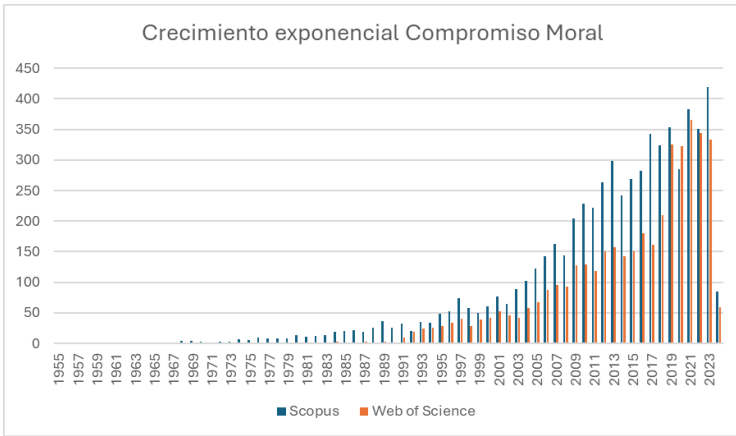
Figure 2: Refinement Criteria of Productivity.



Source: *Refinement Criteria for Ecological Awareness, Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences, and Multidisciplinary, own elaboration.*

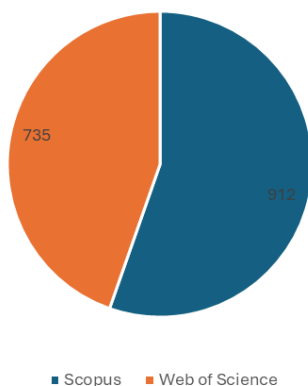
Similarly, between 1976 and 2023, a total of 3,237 articles on Moral Commitment (MC) were published in WoS and 6,203 in Scopus. However, scientific production decreased when the search criteria were focused on social and economic sciences: “Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences, and Multidisciplinary” (See Figure 3).

Figure 3: Exponential Growth of Moral Commitment.



Source: Exponential Growth of Moral Commitment, own elaboration. Subsequently, a scientometric analysis by decade reveals that it is in the last three decades where there has been a real surge in publications on this topic, with the mid-2000s seeing the highest flow of information, demonstrating an R2 of approximately 85%. Therefore, studies on the concept of MC showed a considerable amount of research with 735 articles in WoS and 912 in Scopus (See Figure 4).

Figure 4: Refinement Criteria of Productivity.



Source: *Refinement Criteria of Moral Commitment, Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences, and Multidisciplinary, own elaboration.*

The total of 1,292 articles represents the scientific production of 6,571 authors, and prolific authors were estimated using Lotka's Law (17) (square root of 6571 \approx 81.06). Therefore, it was estimated that the authors with the highest contribution to the production of this knowledge were 81, considering a minimum of 2-4 published documents in the WoS and Scopus databases and a minimum of 83 citations for each author (See Table 1).

Table 1: Prolific Authors in Ecological Consciousness Studies in WoS and Scopus.

Web Of Science		Scopus	
Authors	Number of Documents	Authors	Number of Documents
Aytekin A	2	Yusliza, M.Y.	4
Blanc S	2	Pavlovich, K.	4
Brouwer R	2	Muhammad, Z.	4
Brun F	2	Okumus, F.	3
Barba-sánchez V	2	Mangla, S.K.	3
Bröring S	2	Farooq, K.	3
Börger T	2	Che, Y.	3
Carraresi L	2	Brécard, D.	3
Demaria F	2	Xue, B.	2
Dopico A	2	Wilson, P.A.	2

Source: *Own elaboration.*

However, given the discrete number of articles (Table 1), it is interesting to note that, of the 1292 articles, 93.97% were contributions from authors with only 2 articles published or co-authored, and similarly, 4.96% have participated in 3 or more articles. These constitute 98.93% of the total publications on Ecological Awareness in WOS and Scopus, as these authors can be considered prolific since they have contributed to the generation of knowledge only once or twice on this topic (see Tables 2 and 3).

Table 2: Most Cited Papers in Ecological Awareness Studies in WOS.

N.	Title	Authors	Publisher	Citations
1	A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems	Ghisellini, Patrizia, Cialani, Catia y Ulgiati, Sergio	Journal Of Cleaner Production (2016)	2,596
2	Sample selection bias and presence-only distribution models: implications for background and pseudo-absence data	Phillips, Steven J., Dudik, Miroslav, Elith, Jane, Graham, Catherine H., Lehmann, Anthony, Leathwick, John y Ferrer, Simon	Ecological Applications (2009)	1,965
3	The Hidden World within Plants: Ecological and Evolutionary Considerations for Defining Functioning of Microbial Endophytes	Hardoim, Pablo R., van Overbeek, Leonard S, Berg, Gabriele, Pirttila, Anna Maria, Compant, Stephane, Campisano, Andrea, Doering, Matthias y Sessitsch, Angela	Microbiology And Molecular Biology Reviews (2015)	1,393
4	Microbiome Datasets Are Compositional: And This Is Not Optional	Gloor, Gregory B., Macklaim, Jean M., Pawlowsky-Glahn, Vera y Egozcue,	Frontiers In Microbiology (2017)	1,328

N.	Title	Authors	Publisher	Citations
5	Facilitation in plant communities: the past, the present, and the future	Brooker, Rob W. et al.	Journal Of Ecology (2008)	1,299
6	Suicide prevention strategies revisited: 10-year systematic review	Zalsman, Gil, Hawton, Keith y Wasserman, Danna et al.	Lancet Psychiatry (2016)	998
7	A comprehensive model of the psychology of environmental behaviour-A meta-analysis	Klockner, Christian A.	Global Environmental Change-Human And Policy Dimensions (2013)	877
8	Predicting global change impacts on plant species' distributions: Future challenges	Thuiller, Wilfried, Albert, Cecile, Araujo, Miguel B. et al.	Perspectives In Plant Ecology Evolution And Systematics (2008)	863
9	Understanding and managing conservation conflicts	Redpath, Steve M., Young, Juliette, Evely, Anna et al.	Trends In Ecology & Evolution (2013)	810
10	Situation awareness: Review of Mica Endsley's 1995 articles on situation awareness theory and measurement	Wickens, Christopher D.	Human Factors (2008)	736

Source: Own elaboration.

Table 3: Most Cited Works in Ecological Awareness Studies in Scopus.

N.	Title	Authors	Publisher	Citations
1	A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems	Ghisellini, P., Cialani, C., Ulgiati, S.	Journal of Cleaner Production (2016)	3,175
2	Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature	Beske, P., Land, A., Seuring, S.	International Journal of Production Economics (2014)	634

Sustainability, Innovation and Social Impact

N.	Title	Authors	Publisher	Citations
3	Integrating energy efficiency performance in production management - Gap analysis between industrial needs and scientific literature	Bunse, K., Vodicka, M., Schönleben, P., Brühlhart, M., Ernst, F.O.	Journal of Cleaner Production (2011)	592
4	Human-started wildfires expand the fire niche across the United States	Balch, J.K., Bradley, B.A., Abatzoglou, J.T., Fusco, E.J., Ma-hood, A.L.	Proceedings of the National Academy of Sciences of the United States of America (2017)	566
5	An institutional analysis of payments for environmental services	Vatn, A.	Ecological Economics (2010)	542
6	Risk analysis in green supply chain using fuzzy AHP approach: A case study	Mangla, S.K., Kumar, P., Barua, M.K.	Resources, Conservation and Recycling (2015)	374
7	Consumer behavior and purchase intention for organic food	Paul, J., Rana, J.	Journal of Consumer Marketing (2012)	364
8	Plastic pollution in the marine environment	Thushari, G.G.N., Senevirathna, J.D.M.	Heliyon, (2020)	338
9	Environmental awareness and initiatives in the Swedish and Polish hotel industries-survey results	Bohdanowicz, P.	International Journal of Hospitality Management (2006)	319
10	Remote sensing for lake research and monitoring - Recent advances	Dörnhöfer, K., Oppelt, N.	Ecological Indicators (2016)	298

Source: Own elaboration.

The total of 1,647 articles represents the scientific output of 7,451 authors, and prolific authors were estimated using Lotka's Law (17), (square root of 7,451 \approx 81.06). Therefore, it was estimated that the authors with the greatest contribution to the production of this knowledge were 81, considering a minimum of 2–5 documents

published in the WOS and Scopus databases and a minimum of 90 citations per author (see Tables 4 and 5).

Table 4: Prolific Authors in Moral Commitment Studies in WOS and Scopus.

Web Of Science ris3			Scopus	
	Authors	Number of Documents	Authors	Number of Documents
1	Perry SL	4	Caldwell, C.	5
2	Ruiz-palomino P	4	Hielscher, S.	4
3	Di Bartolomeo G	3	Walser, R.D.	3
4	Dionne G	3	Strudler, A.	3
5	Ha-brookshire J	3	Schminke, M.	3
6	Hielscher S	3	Pies, I.	3
7	Martínez-cañas R	3	Papa, S.	3
8	Papa S	3	Hasan, Z.	3
9	Simha A	3	Ha-Brookshire, J.	3
10	Wang XY	3	Farnsworth, J.K.	3

Source: Own elaboration.

However, given the discrete number of articles (Table 4), it is interesting to note that, out of the 1,647 articles, 98.85% were contributions from authors with only 2 published articles or co-authorships, and similarly, 3.96% have participated in only 3 or more articles. These account for 98.93% of the total publications on Moral Commitment in WOS and Scopus, as these authors can be considered prolific due to having contributed to the generation of knowledge only once or twice on this topic (see Tables 5 and 6).

Table 5: Most Cited Works in Moral Commitment Studies in WOS.

N.	Title	Authors	Publisher	Citations
1	Prioritizing the Mental Health and Well-Being of Healthcare Workers: An Urgent Global Public Health Priority	Sovold, Lene E., Naslund, John A., Kousoulis, Antonis A., Saxena, Shekhar, Qoronfleh, M. Walid, Grobler, Christoffel y Munter, Lars	Frontiers In Public Health	232
2	Saliva Direct: A simplified and flexible platform to enhance SARS- CoV-2 testing capacity	Vogels, Chantal B. F., Watkins, Anne E, Harden, Christina A. et al	Med (2021)	169
3	Corporate social responsibility and pro-environmental behavior at workplace: The role of moral reflectiveness, coworker advocacy, and environmental commitment	Afsar, Bilal y Umrani, Waheed Ali	Corporate Social Responsibility And Environmental Management (2020)	148
4	A Meta-Analytic Review of Paternalistic Leadership	Bedi, Akanksha	Applied Psychology - An International Review- Psychologie Appliquee- Revue Internationale (2020)	53
5	Walking the Talk on Diversity: CEO Beliefs, Moral Values, and the Implementation of Workplace Diversity Practices	Ng, Eddy S. y Sears, Greg J.	Journal Of Business Ethics (2020)	49
6	Final-year nursing students called to work: Experiences of a rushed labour insertion during the COVID- 19 pandemic	Gomez-Ibanez, Rebeca, Watson, Carolina, Manuel Leyva-Moral, Juan, Aguayo - Gonzalez, Mariela y Granel,	Nurse Education In Practice	44

N.	Title	Authors	Publisher	Citations
7	Linking Entrepreneurial Orientation with Innovation Performance in SMEs; the Role of Organizational Commitment and Transformational Leadership Using Smart PLS-SEM	Iqbal, Shuja, Martins, Jose Moleiro, Mata, Mario Nuno, Naz, Shumaila, Akhtar, Shamim y Abreu, Antonio	Sustainability (2021)	43
8	Can paternalistic leaders enhance knowledge sharing? The roles of organizational commitment and Islamic work ethics	Chaudhary, Arooba, Islam, Talat, Ali, Hafiz Fawad y Jamil, Saqib	Global Knowledge Memory And Communication (2023)	42
9	Forty years of research on factors influencing ethical decision making: Establishing a future research agenda	Casali, Gian Luca y Perano, Mirko	Journal Of Business Research (2021)	37

Source: *Own elaboration.*

Table 6: Most Cited Works in Moral Commitment Studies in Scopus.

N.	Title	Autors	Publisher	Citations
1	Loyalty-based management.	Reichheld, F.F.	Harvard Business Review (1993)	780
2	Protected Values	Baron, J., Spranca, M.	Organizational Behavior and Human Decision Processes (1997)	522
3	Identity, morals, and taboos: Beliefs as assets	Bénabou, R., Tirole, J.	Quarterly Journal of Economics (2011)	426
4	Corporate social responsibility in the 21st century: A view from the world's most successful firms	Snider, J., Hill, R.P., Martin, D.	Journal of Business Ethics (2003)	410
5	Seeking legitimacy for new assurance forms: The case of assurance on sustainability reporting	O'Dwyer, B., Owen, D., Unerman, J.	Accounting, Organizations and Society (2011)	391

N.	Title	Autors	Publisher	Citations
6	Three roads to organizational justice	Cropanzano, R., Rupp, D.E., Mohler, C.J., Schminke, M.	Research in Personnel and Human Resources Management (2001)	325
7	The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle	Acharya, V., Naqvi, H.	Journal of Financial Economics (2012)	318
8	The effect of leader moral development on ethical climate and employee attitudes	Schminke, M., Ambrose, M.L., Neubaum, D.O.	Organizational Behavior and Human Decision Processes (2005)	293
9	The Role of Lockups in Initial Public Offerings	Brav, A., Gompers, P.A.	Review of Financial Studies (2020)	282
10	Governmentality Matters: Designing an Alliance Culture of Inter-organizational Collaboration for Managing Projects	Clegg, S.R., Pitsis, T.S., Rura-Polley, T., Marosszeky, M.	Organization Studies (2002)	270

Source: Own elaboration.

Table 7: Institutions and Sources on the Topic of Ecological Awareness in WOS and Scopus.

Web Of Science			Scopus	
N.	Institution or University	Qty.	Institution or University	Qty.
1	Centre National De La Recherche Scientifique Cnrs	12	Chinese Academy of Sciences	10
2	INRAE	8	Wageningen University & Research	8
3	Universite De Montpellier	7	Beijing Normal University	7
4	Autonomous University Of Barcelona	6	Universität Bonn	6
5	Institut Agro	6	The Hong Kong Polytechnic University	6
6	Institut Agro	6	University of KwaZulu- Natal	6
7	University Of Bonn	6	Technische Universität München	6
8	Chinese Academy Of Sciences	5	Uniwersytet Jagielloński	6
9	University Of Queensland	5	The University of Queensland	6

Web Of Science			Scopus	
N.	Institution or University	Qty.	Institution or University	Qty.
10	University Of Tennessee System	5	Universiti Teknologi MARA	5

Source: Own Elaboration.

Table 8: Publishers and Sources on the Topic of Ecological Awareness in WOS and Scopus.

Web Of Science			Scopus	
N.	Editorial	Qty.	Editorial	Qty.
1	Sustainability	246	Journal Of Cleaner Production	67
2	Ecological Economics	95	Ecological Economics	42
3	Ecological Indicators	92	Environment Development And Sustainability	31
4	Journal Of Cleaner Production	80	Marine Policy	24
5	Science Of The Total Environment	78	Resources Conservation And Recycling	14
6	International Journal Of Environmental Research And Public Health	73	Journal Of Sustainable Tourism	11
7	Plos One	70	Resources Policy	10
8	Journal Of Environmental Management	46	Journal Of Outdoor Recreation And Tourism	10
9	Biological Conservation	38	Resources Science	9
10	Environmental Science And	38	Forest Policy And	9

Source: Own Elaboration.

Table 9: Countries with Scientific Productivity on the Topic of Ecological Awareness in WOS and Scopus.

Web Of Science			Scopus	
N.	Country	Qty.	Country	Qty.
1	Usa	69	United States	121
2	Peoples R China	47	China	112

Web Of Science			Scopus	
N.	Country	Qty.	Country	Qty.
3	Germany	41	United Kingdom	60
4	England	37	Germany	59
5	Spain	32	India	52
6	France	29	Australia	43
7	Italy	23	Italy	39
8	Australia	18	France	37
9	Canada	16	Spain	36
10	Netherlands	15	Poland	35

Source: Own elaboration.

Table 10: Institutions and sources on the topic of Moral Behavior in WOS and Scopus.

Web Of Science			Scopus	
N.	Institution or University	Qty.	Institution or University	Qty.
1	UNIVERSITY OF LONDON	15	University of Pennsylvania	8
2	HARVARD UNIVERSITY	13	Stanford University	8
3	UNIVERSITY OF MELBOURNE	12	National Bureau of Economic Research	8
4	UNIVERSITY OF TEXAS SYSTEM	11	University of Melbourne	8
5	NATIONAL BUREAU OF ECONOMIC RESEARCH	10	Harvard University	7
6	UNIVERSITY OF CALIFORNIA SYSTEM	10	University of Oxford	7
7	UNIVERSITY SYSTEM OF OHIO	10	Universität Zürich	6
8	NEW YORK UNIVERSITY	9	University of Virginia	6
9	STANFORD UNIVERSITY	8	University of California, Berkeley	6
10	UNIVERSITE DE MONTREAL	8	HEC Montréal	5

Source: Own elaboration.

Table 11: Countries on the topic of Moral Behavior in WOS and Scopus.

Web Of Science			Scopus	
N	Country	Qty.	Country	Qty.
1	Perry SL	4	United States	322
2	Ruiz-palomino P	4	United Kingdom	105
3	Di Bartolomeo G	3	Germany	41
4	Dionne G	3	Australia	41
5	Ha-brookshire J	3	France	39
6	Hielscher S	3	Canada	34
7	Martínez-cañas R	3	Italy	32
8	Papa S	3	Spain	30
9	Simha A	3	Netherlands	29
10	Wang XY	3	China	29

Source: Own elaboration.

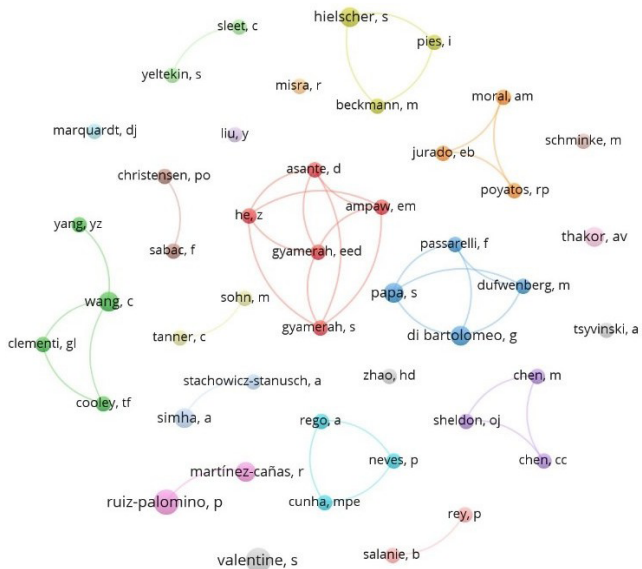
Table 12: Publishers and source on the topic of Moral Behavior in WOS and Scopus.

Web Of Science			Scopus	
N.	Editorial	Qty.	Editorial	Qty.
1	Journal Of Business Ethics	109	Journal Of Business Ethics	80
2	Journal Of Medical Ethics	18	Science And Engineering Ethics	17
3	Bioethics	16	Developments In Marketing Science Proceedings Of The Academy Of Marketing Science	14
4	American Journal Of Bioethics	8	Business Ethics Quarterly	10
5	Journal Of Bioethical Inquiry	8	Plos One	8
6	Leadership Organization Development Journal	8	Mediterranean Journal Of Social Sciences	7
7	Business Ethics Quarterly	7	Journal Of Management Development	7
8	International Journal Of Ethics And Systems	7	Public Integrity	6
9	Kennedy Institute Of Ethics Journal	7	Journal Of Economics And Management Strategy	6
10	Management Science	7	Ethical Economy	6

Source: Own elaboration.

As shown in Figure 5, from the Web of Science database, of the 2019 authors who have published as either authors or co-authors, applying Lotka’s law, the prolific authors on the topic of moral commitment are 45 authors. Collaborative work connections were found in 11 clusters; however, no inter-cluster connections were observed that would help visualize collaborations between authors (See Figure 5).

Figure 5: Prolific co-authorship figure and its relationships on Moral Commitment.



Source: Own elaboration.

In Table 13, each of the clusters is detailed in terms of their institutional and national affiliation.

Table 13: Prolific author groups and affiliations with 4 or more connections on Moral Commitment.

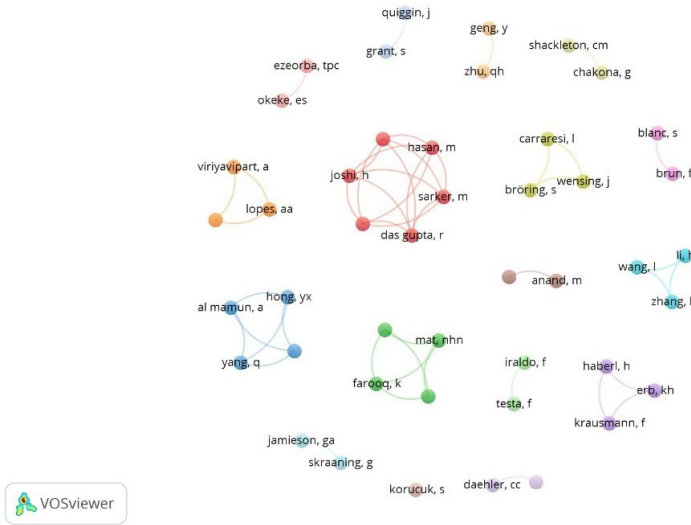
Nombre de los autores	Red
Gyamerat, Eed	Red
He, Z	Red
Gyamerat, S	Red

Nombre de los autores	Red
Ampaw, EM	Red
Asante, D	Red
Yang, YZ	Green
Cooley, TF	Green
Clementi, GL	Green
Wang, C	Green
Di Bartolomeo, G	Blue
Dufwenberg, M	Blue
Papa, S	Blue
Passarelli, F	Blue
Dionne, G	Yellow
Lam, LW	Yellow
Liu, Y	Yellow
Picard, P	Yellow

Source: *Own elaboration.*

For ecological awareness, out of the 2,656 authors who have published applying Lotka's law, only 52 can be considered prolific authors. Similarly, it is evident that there are connections between authors, but no interconnections between other research groups, indicating that studies have focused on certain countries without extending research beyond the idiosyncrasies of these countries (See Figure 6).

Figure 6: Prolific co-authorship figure and their relationships on Ecological Awareness.



Source: Own elaboration.

In Table 14, each of the clusters is detailed in terms of their institutional and national affiliation.

Table 14: Prolific author groups and affiliations with 4 or more connections in Ecological Awareness.

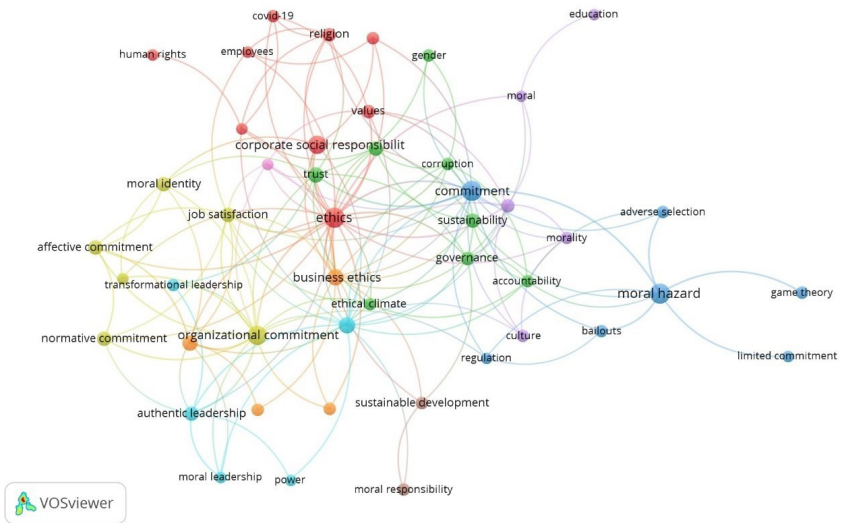
Nombre de los autores	Red
Das Gupta, R	Red
Haider, MR	Red
Hasan, M	Red
Sarker, M	Red
Joshi, H	Red
Sutradhar, I	Red
Farooq, K	Green
Mat, NHN	Green
Muhammad, Z	Green
Yusliza, MY	Green
Li, H	Yellow
Li, YY	Yellow
Wang, I	Yellow
Zhag, I	Yellow

Source: Own elaboration.

As part of the findings, it cannot be overlooked how these prolific authors have contributed to the publication on moral awareness and ecological awareness, where collaborative works have helped to gain a clearer understanding of these topics.

From the Scopus database, the scientific production on moral commitment was analyzed, and keyword groups were created. A total of 2443 keywords were analyzed, and based on Zipf's law, 50 keywords were selected, considering the square root of 2443 ($=49.42$) as the estimator, with the highest frequency of usage (See Figure 7).

Figure 7: Keyword co-occurrence graph of Moral Commitment.

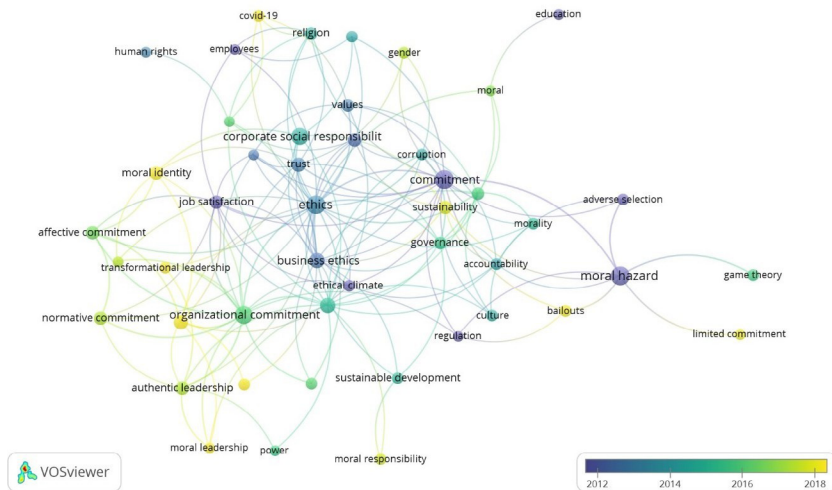


Source: Own elaboration.

The set of keywords generated seven thematic clusters that demonstrate the interdisciplinary nature of moral commitment. The blue cluster focuses on concepts such as commitment, rescues, limited commitment, gamma theory, adverse selection, and regulation. The yellow cluster addresses moral identification, job satisfaction, commitment norms, commitment effectiveness, and committed organizations. The brown cluster includes moral responsibility and sustainable development. The red cluster highlights ethical issues, corporate social responsibility, employment, human risks, and values. The sky blue cluster explores authentic and transformational

leadership. The green cluster brings together topics like governance, sustainability, corruption, ethical climate, and accountability. Finally, the purple cluster emphasizes culture, morality, and education, while the orange cluster refers specifically to business ethics. Notably, the connections between these seven clusters are significant, revealing a strong network of interrelated themes surrounding the study of moral commitment (see Figure 8).

Figure 8



Source: Own elaboration.

The previous illustration highlights that recent research trends related to moral commitment can be identified as follows (see Table 15).

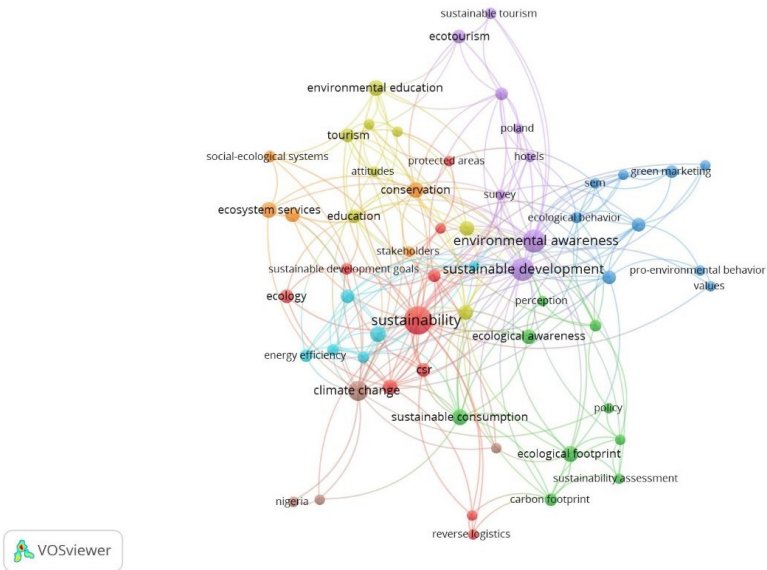
Table 15: Mature Keywords and Emerging Themes on Moral Commitment.

Emerging Themes	Emerging Themes
Job Satisfaction	Sustainability
Human Risk	Moral Identity
Ethics	Moral Leadership
Values	Bounded Commitment
Moral Hazard	Transformational Leadership

Source: Own elaboration.

In turn, the scientific output on ecological awareness was analyzed, leading to the formation of keyword clusters. Out of a total of 3,514 keywords, and following Zipf's law, 59 keywords were selected, using the square root of 3,514 ($= 59.27$) as an estimator, representing those with the highest frequency of use (See Figure 9).

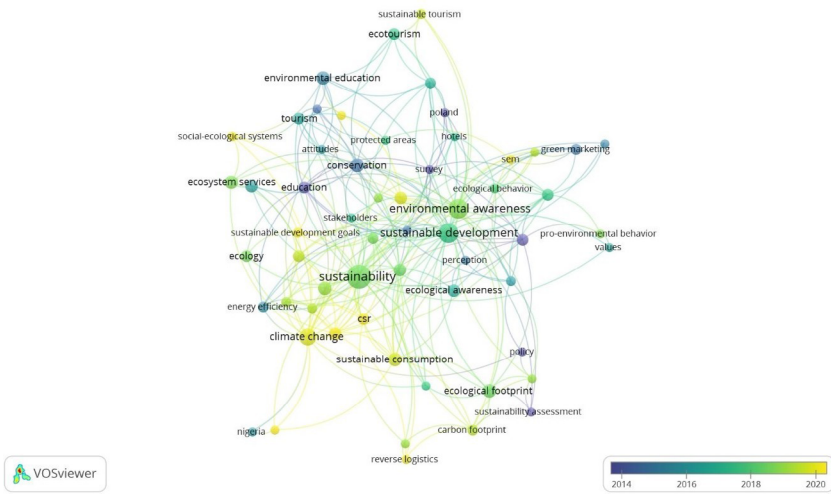
Figure 9: Keyword co-occurrence graph on Ecological Awareness.



Source: Own elaboration.

Thus, the set of keywords generated seven clusters: the blue cluster is focused on biological behavior, green marketing, and values; the yellow cluster centers on education, skills, tourism, and environmental education; the red cluster addresses topics such as sustainability, ecology, change, and the development of sustainable goals; the green cluster refers to ecological awareness, carbon footprint, perception, consumption, and policy; the purple cluster includes environmental awareness, sustainable development, ecotourism, and sustainable tourism; the orange cluster highlights ecosystem services, conservation, stakeholders, and socio-ecological systems; and the brown cluster deals with climate change. It is important to emphasize that the level of connection among the seven clusters is significant (See Figure 10).

Figure 10: Topics related to Ecological Awareness.



5. Discussion

Moral commitment and ecological awareness in the use of water within fields such as social and economic sciences reveal a complex intersection of theories, methodological approaches, and empirical findings (17). Throughout the decades analyzed, from 1976 to 2023, significant progress has been made in understanding how ethical and environmental decisions impact the sustainable management of water resources. The theoretical foundations provided have enabled exploration of these topics from multiple perspectives, ranging from business ethics to environmental psychology and ecological economics (15).

The integration of ethical theories, such as utilitarianism and deontology, has enriched the discussion on how organizations and individuals make morally responsible decisions concerning water. This is particularly crucial in a global context where water scarcity and environmental impacts are becoming increasingly evident (16). Furthermore, the application of economic and resource management theories has provided insights into the incentives and barriers to

adopting sustainable practices, showing how market mechanisms can align with environmental goals.

The discussion has also underscored the importance of environmental governance and public policy in promoting ethical and sustainable water use practices. Effective regulation and collaboration among multiple stakeholders are essential to ensuring that ethical decisions translate into concrete actions that benefit both the environment and affected communities (14). Environmental justice and sustainable development emerge as guiding principles that should inform water-related policies and practices, ensuring equitable access and fair distribution of this vital resource.

6. Conclusions

The study of moral commitment and ecological awareness in water use within the social and economic sciences has proven to be essential in addressing contemporary challenges related to sustainability and environmental ethics. Through a multidisciplinary approach and the application of diverse theories, significant progress has been made in understanding how individual and organizational decisions affect long-term water resource management.

However, important challenges remain, such as the need for more effective integration of theoretical and methodological approaches and the improvement of geographic and cultural representation in research. Future studies should focus on strengthening international collaboration and effective governance, as well as on developing practical strategies to promote ethical and sustainable behavior across all sectors of society.

Ultimately, continued engagement with these issues is not only crucial for protecting our water resources, but also for advancing toward a more just and equitable global development model, where ethics and environmental sustainability serve as fundamental pillars of our actions and decisions.

7. Bibliography

- [1] Acevedo-Duque, Á.; Vega-Muñoz, A.; Salazar-Sepúlveda, G. Analysis of Hospitality, Leisure, and Tourism Studies in Chile. *Sustainability* 2020, 12, 7238. <https://doi.org/10.3390/su12187238>
- [2] Chenoweth, J., López-Avilés, A., Morse, S., & Druckman, A. (2016). Water consumption and subjective wellbeing: An analysis of British households. *Ecological Economics*, 130, 186-194. <https://doi.org/10.1016/j.ecolecon.2016.07.006>
- [3] Duque, Á. A., Álvarez-Herranz, A., & Marinao-Artigas, E. (2023). Scientometrics study of country branding and its contribution to sustainable development in nations. *Data and Metadata*, 2, 163-163. DOI: <https://doi.org/10.56294/dm2023163> Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards,
- [4] J. S., Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International Journal of Information Management*, 55. <https://doi:10.1016/j.ijinfomgt.2020.102211>
- [5] Eckert, M., Volmerg, J. S., & Friedrich, C. M. (2019). Augmented Reality in Medicine: Systematic and Bibliographic Review. *JMIR Mhealth Uhealth*, 7(4). <https://doi:10.2196/10967>
- [6] Elblaus, L., Unander-Scharin, A., & Unander-Scharin, C. (2017). Uncanny Materialities: Digital Strategies for Staging Supernatural Themes Drawn from Medieval Ballads. *Leonardo Music Journal*, 27, 62-66. https://doi:10.1162/LMJ_a_01020
- [7] González-Díaz, R. R., Acevedo-Duque, Á. E., Guanilo-Gómez, S. L., y Cruz-Ayala, K. (2021). Ruta de Investigación Cualitativa – Naturalista: Una alternativa para estudios gerenciales. *Revista de Ciencias Sociales (Ve)*, XXVII(Especial 4), 334- 350.
- [8] Lowe, B., Lynch, D., & Lowe, J. (2015). Reducing household water consumption: a social marketing approach. *Journal of marketing management*, 31(3-4), 378-408. <https://doi.org/10.1080/0267257X.2014.971044>
- [9] Molina, E., Quesada, F., Calle, A., Ortiz, J., & Orellana, D. (2018). Consumo sustentable de agua en viviendas de la ciudad de Cuenca. *Ingenius. Revista de Ciencia y Tecnología*, (20), 28-37. <https://doi.org/10.17163/ings.n20.2018.03>
- [10] Manco Silva, D. G., Guerrero Erazo, J., & Ocampo Cruz, A. M. (2012). Eficiencia en el consumo de agua de uso residencial. *Revista Ingenierías Universidad de Medellín*, 11(21), 23-38.
- [11] Pérez, Z. E. R., González, M. J. C., & Romero, D. C. R. (2020). Estimación y hábitos del consumo de agua para fines domésticos en una zona residencial de San Cristóbal, Venezuela. *Revista Luna Azul*, (51), 95-120. <https://doi.org/10.17151/luaz.2020.51.6>
- [12] Salem, M. Z., & Ertz, M. (2023). Water consumption rationalization using demarketing strategies in the Gaza Strip, Palestine. *Water Resources and Economics*, 43, 100227. <https://doi.org/10.1016/j.wre.2023.100227>

- [13] Sepúlveda Moreno, C. O., Moreno Moreno, L. R., & Millán López, N. T. (2023). Explorando las Emociones y la Conciencia del Agua en Sonora, México: Un Análisis sobre su Impacto en el Cuidado del Recurso Hídrico.
- [14] Zulqarnain, A., & Khan, M. A. (2024) Thirsty nation: An investigation into water scarcity and public conservation behaviour in Pakistan. *Water and Environment Journal*. <https://0711bgzpq-y-https-doi-org.itmsp.museknowledge.com/10.1111/wej.12930>

