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Fall 10-1-2020

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Deka, Pranjal and Sarmah, Mukut, "Co-Occurrence of Keywords in Ecocriticism Research Publications: An Analytical Approach" (2020). *Library Philosophy and Practice (e-journal)*. 4452.
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Co-Occurrence of Keywords in Ecocriticism Research Publications: An Analytical Approach

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Abstract:

The keyword is a significant part of scholarly publications, which can play a vital role in information retrieval and research. Author Keywords are those provided by the original authors, and Keywords Plus are those extracted from the titles of the cited references by Thomson Reuters. Keywords Plus are those created by an automatic computer algorithm; these are words or phrases that frequently appear in the titles of an article's references and not necessarily in the article's title or as Author.

The Web of Science (WoS) database is used to conduct this study. While conducting this study, a total of 654 documents were found from 1992 to 2020 in Ecocriticism. Extracted data is visualized through VOSviewer. Keywords are separated into three categories- All Keywords, Author Keywords, and Keywords Plus. Calculate the value of Overlap and Redundancy

This study attempts to discern and trace out the keywords in Ecocriticism research publications.

Keywords: Ecocriticism, Author keywords, Keywords Plus, Vosviewer.Overlap, Redundancy.

Introduction:

The range of environmental studies has increased in various dimensions. It also belongs to science as well as literature. One of the vital parts in the range of such studies is ecocriticism. 'The word 'ecocriticism' first looked in William Ruecker's essay "Literature and Ecology: An Experiment in Ecocriticism" in 1978. However, it was only in the 1990s that ecocriticism emerged as a separate discipline, although it is a fact that the relationship between man and his physical environment had always been fascinating to literary critics. The interest is at the scientific level, as well as various forms of literary expressions. Human beings have a natural quest to find their 'roots' and be a part of the natural environment that they belong to. But at the same time, they have overexploited natural resources and exploited nature to its fullest'.

Ecocriticism is a term used to study the relationship between the literature and the earth's environment. It takes an interdisciplinary perspective by analyzing specific works in the context of environmental issues and nature. Some poetries all these terms as a broad approach in scope and

several other names: environmental literary criticism, Green Study, and Ecopoetics. It is also referred to by other fields such as ecology, social ecology, biopolitics, sustainable design, environmental history, environmentalism, etc. The term ecocriticism was first defined by Cheryll Glotfelty in simple words making it straightforward for everyone, be it critics and writers. Seeing the definition, it can be called an ‘increasingly heterogeneous movement.’

This study attempts to trace out the Co-Occurrence of Keywords in Ecocriticism Research Publications, through the lens of Web of Science.

Objectives of the Study:

- To find out the most frequently used keywords in the field of ecocriticism.
- To find out the co-occurrence of keywords in the field of ecocriticism.
- To find out the link strength of the keywords in the field of ecocriticism.
- To select the top keywords in the field of ecocriticism.
- To find out the value of Overlap and Redundancy of keywords.

Scope and Limitation of the Study:

Conclusion this study covers only the Web of Science database for data retrieval; no other database is taken.


Methodology:


To conduct this study, data were collected from the Web of Science database. Only the term ‘Ecocriticism’ is taken as a search term. A total no of 654 documents is available (September 2020). All data are saved in the TXT file. Collected data is visualized through the VOSviewer; keywords are separated to excel sheets.

Data Analysis and Discussion:


Co-occurrence of all keywords:

In this study, select the minimum number of keywords occurrence is 5; of the 1206 keywords, 29 meet the thresholds. The co-occurrence of all keywords is analyzed through the VOSviewer. Fig - 1 shows the co-occurrence of all keywords(including author keywords and keywords plus) in ecocriticism. All keywords with occurrences and link strengths are tabulated in the table-1.

 **Clusters -1** covers the keywords: ecophobia, environmental humanities, globalization, postcolonial ecocriticism, postcolonial studies, postcolonialism,

 **Cluster-2**, cover the keywords ecocriticism, environmental justice, landscape, nature, nature writing, poetry.

 **Cluster-3**, cover the keywords Anthropocene, climate, ecology, history, politics space.

 **Cluster-4**, cover the keywords animal studies, anthropocentrism, literature, posthumanism.

- Cluster-5**, cover the keywords ecofeminism, material ecocriticism, sea.
- Cluster-6**, cover the keywords conservation and environment.
- Cluster-7**, cover the keyword postcolonial

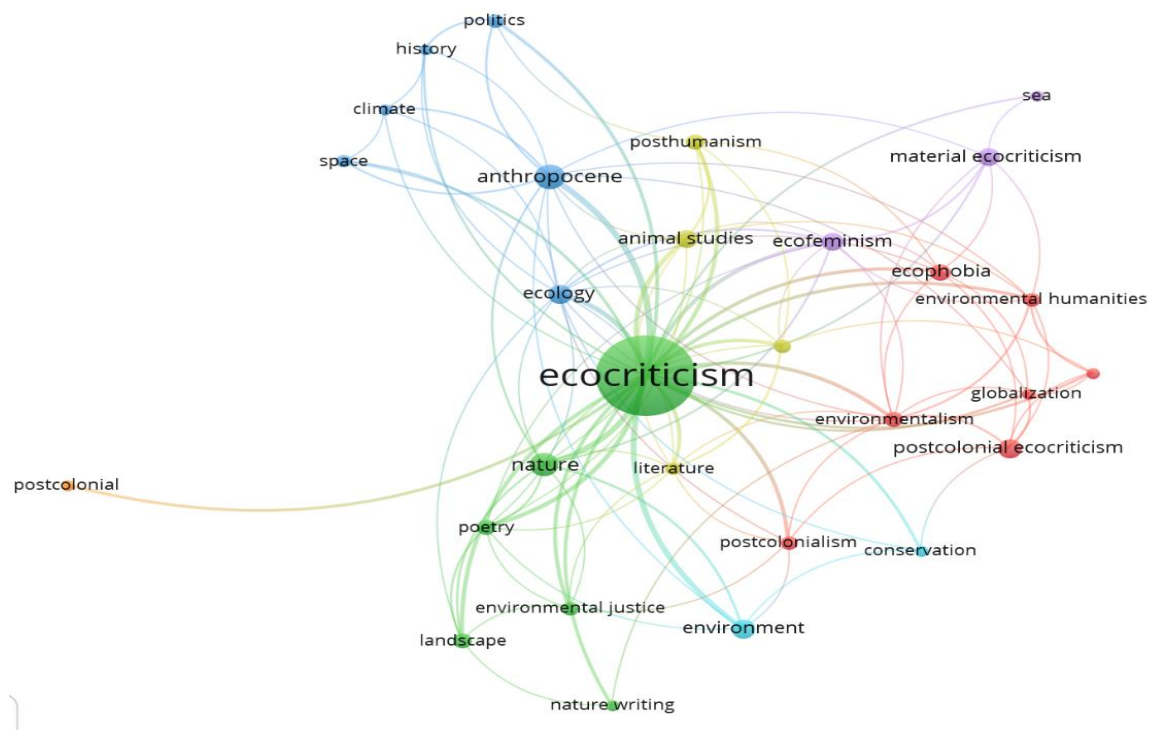


Fig- 1: VOSviewer co-occurrence Network visualization mapping of most frequent all keywords (minimum of 5 occurrences) in Ecocriticism.

Table-1: Occurences of all keywords in Ecocriticism


Keyword	Occurrences	Total Link Strength
Animal Studies	11	17
Anthropocene	21	32
Anthropocentrism	7	14
Climate	5	6
Conservation	5	7
Ecocriticism	227	176
Ecofeminism	11	20
Ecology	14	25
Ecophobia	10	13
Environment	14	20
Environmental Humanities	7	15


Environmental Justice	7	11
Environmentalism	9	20
Globalization	5	9
History	5	7
Landscape	8	14
Literature	6	15
Material Ecocriticism	11	9
Nature	19	31
Nature Writing	5	7
Poetry	9	19
Politics	7	10
Postcolonial	5	5
Postcolonial Ecocriticism	14	9
Postcolonial Studies	5	9
Postcolonialism	7	12
Posthumanism	9	13
Sea	5	3
Space	6	8

(Minimum 5 occurrences)


Co-Occurrence of Author Keywords:


In this study, select the minimum number of authors keywords' occurrence is 5; from 1064 keywords, 23 meet the thresholds. Co-occurrence of author keywords visualized through the VOS Viewer. Fig -2 shows the network of author keywords through the VOSviewer. In 6 cluster


 **Cluster-1** covers ecofeminism, ecophobia, environmental humanities, environmentalism, globalization, material ecocriticism, postcolonial ecocriticism, and postcolonial studies.

 **Cluster-2**, ecocriticism, environmental justice, landscape, nature, nature writing, poetry.

 **Cluster-3**, anthropocentrism, ecology, literature.

 **Cluster-4**, anthropocene, environment, postcolonialism.

 **Cluster-5**, animal studies, posthumanism,

 **Cluster-6**, postcolonial.

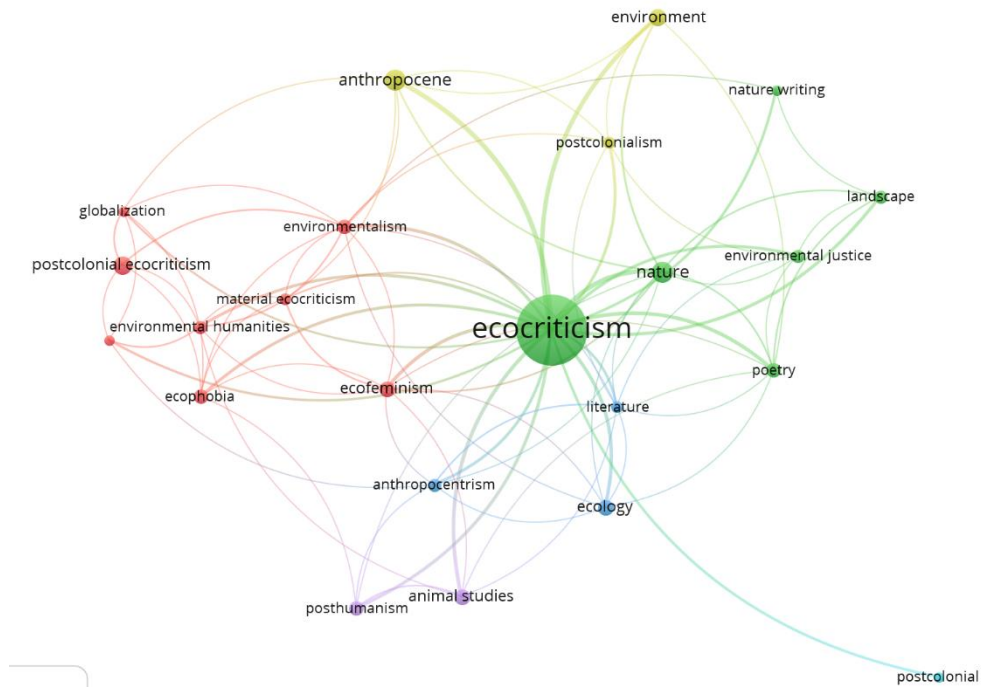


Fig-2: VOSviewer co-occurrence Network visualization mapping author keywords (minimum of 5 occurrences) in Ecocriticism.

Table -2 Co-occurrence of Author Keywords

Keyword	Occurrences	Total Link Strength
Animal Studies	11	15
Anthropocene	19	22
Anthropocentrism	7	13
Ecocriticism	207	151
Ecofeminism	11	19
Ecology	10	14
Ecophobia	9	12
Environment	13	19
Environmental Humanities	7	14
Environmental Justice	7	11
Environmentalism	9	20
Globalization	5	9
Landscape	8	13
Literature	6	14
Material Ecocriticism	6	8
Nature	19	30
Nature Writing	5	7

Poetry	9	19
Postcolonial	5	5
Postcolonial Ecocriticism	14	7
Postcolonial Studies	5	9
Postcolonialism	6	11
Posthumanism	9	12

(Minimum of 5 occurrences)

Co-occurrence of Keywords Plus:

In this study, select the minimum number of authors keywords' occurrence is 5; of the 184 keywords, 6 meet the thresholds. The networks of co-occurrence of keywords plus visualized through the VOS viewer. The keywords plus show in two clusters.



Cluster-1 covers the keywords climate, history, politics.



Cluster-2 covers the keywords ecocriticism, material ecocriticism, sea.



Fig: 3- VOSviewer co-occurrence Network visualization mapping keywords plus (minimum of 5 occurrences) in Ecocriticism

Table-3: Co-occurrence of Keywords Plus

Keyword	Occurrences	Total Link Strength
Climate	5	1
Ecocriticism	24	3
History	5	4
Material Ecocriticism	5	1
Politics	7	3
Sea	5	2

(Minimum 5 Occurrences)

Top Five most Frequently used Author Keywords and Keyword Plus:

Table- 5 shows the most frequently used author keywords and Keywords plus in ecocriticism publications. From the side of occurrence, the top five author keywords are Ecocriticism (207), Nature (19), Anthropocene (19), Environment (13), and Animal Studies (11).

The top five keywords Plus are Ecocriticism (24), Politics (7), History (5), Material Ecocriticism (5), Climate(5).

Table-4: Top Five most frequently used Author Keywords and Keyword Plus

Rank	Author Keywords	Occurrence	Keywords Plus	Occurrence
1	Ecocriticism	207	Ecocriticism	24
2	Nature	19	Politics	7
3	Anthropocene	19	History	5
4	Environment	13	Material Ecocriticism	5
5	Animal Studies	11	Climate	5

Top Five High Link Strength Author Keywords and Keyword Plus:

Table-5 shows the top five author keywords and keywords plus from the link strength. The top five author keywords are Ecocriticism (151), Nature (30), Anthropocene (22), Environmentalism (20), Ecofeminism (19).

Keywords Plus are History (4), Ecocriticism (3), Politics (3), Sea (2), Climate (1)

Table-5: Top Five High Link Strength Author Keywords and Keyword Plus

Rank	Author Keywords	Link Strength	Keywords Plus	Link Strength
1	Ecocriticism	151	History	4
2	Nature	30	Ecocriticism	3
3	Anthropocene	22	Politics	3
4	Environmentalism	20	Sea	2
5	Ecofeminism	19	Climate	1

Overlap and Redundancy of Author Keywords and Keywords Plus:

Overlap (O) and Redundancy (R) were calculated for the literature containing both types of keywords. Overlap (O) is defined by

$$O = \frac{K(V_i) \cap A(V_j)}{K(V_i) \cup A(V_j)}$$

Where $K(V_i)$ is the set of Keywords Plus, and $A(V_j)$ is the set of Author Keywords. O's value is 1 if $K(V_i)$ is equal to $A(V_j)$, and 0 when the two sets of keywords do not intersect at all.

$$\text{Here, Overlap } (O) = \frac{2}{27} = 0.074$$

Redundancy (R), the reappearance of Author Keywords in Keywords Plus, is defined by

$$R = \frac{[K(V_i) \cap A(V_j)]}{[A(V_j)]}$$

$$\text{Here Redundancy } (R) = \frac{2}{23} = 0.086$$

Conclusion:

This study highlights a scenario of ecocriticism publications. The study shows all keywords used in ecocriticism related research. Total no of 1206 keywords are found with a minimum of five times occurrence, 29 meet the thresholds. In author keywords, 1064 keywords are found with a minimum of five times occurrence; here, 23 meet the thresholds. In Keywords plus 184 keywords found with minimum five times occurrence, 6 meet the thresholds. The top five author keywords are Ecocriticism (207), Nature (19), Anthropocene (19), Environment (13), and Animal Studies (11) and the top five keywords Plus are Ecocriticism (24), Politics (7), History (5), Material Ecocriticism (5), Climate(5). The value of the Overlap is 0.074, and the Redundancy is 0.086. To determine research productivity in a different domain, keywords analysis is the most beneficial aspect.

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