

What Environmentalists want to Cite: A Bibliometric Study based on Environmental Conservation Journal

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Abstract

The current bibliometric study is focussed on an examination of 255 articles/research papers that were published in the Environmental Conservation Journal, a venerable journal in the environmental area by taking into consideration its last five volumes from 2016 to 2020. In addition to discussing the average length of an article and the number of references per article, the study also covers the year and volume-wise number of articles, authorship patterns, most productive authors of the journal, state-wise contribution of the articles, and foreign contribution to the journal.

Keywords: Authorship pattern, Bibliometric Study, Environment and Conservation.

INTRODUCTION

Allen Prichard was the first who coined the term "bibliometrics," in 1969 which refers to the "application of mathematics and statistical methodologies to books and other media of communication" (Pitchard, 1969). This phrase bears similarities to the terms "Informetrics" by Nacke (1979), "Librametry" by Ranganathan (1949), and "Scientometrics" by Nalimov and Mulchenko (1969).

Since its inception, bibliometrics has evolved into a scientific method for evaluating the literature that is used to quantitatively analyse academic resources and analyse publications for their significance and influence. Using both theoretical and applied research approaches as well as scholarship, bibliometricians and scholars employ bibliometrics to comprehend their particular literatures and to provide light on the development of disciplines and the phenomenon of scholarly communication (Hérubel, 1999). It makes possible to map out and increase the understanding of a specific topic of study by showing links between the major works, writers, organisations, themes, and other aspects of the subject matter.

EARLIER STUDIES

Many bibliometric studies are conducted for different subjects by the library scientists. Below is given a summary of some of the significant bibliometric research that has been done in the

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domains of botany and related fields.

Vergidis et al. (2005) have carried out a bibliometric study for evaluating the quantity and quality of global research production in the discipline of Microbiology during the years 1995-2003 using the PubMed and Journal Citation Reports databases. 74 journals that were also included in PubMed by searching for the phrase "microbiology," were noted. Further, a total of 89,527 articles were identified for analysis from these journals, and the data on the country in which the research originated was available for 88,456 (98.8%) of them. The individual countries were separated into nine world regions. It was discovered during the study period that Western Europe has produced more research than any other location in the world, with the USA coming in second. The USA had the highest mean effect factor of 3.4. Further, the three regions in which research productivity increased the most were Asia, Latin America, and Eastern Europe.

A bibliometric analysis of Indian botanists' contributions to the Journal of the Indian Botanical Society from 1997 to 2001 was carried out by Dhiman and Rani (2005). The purpose of the study is to determine the length of the articles, the pattern of authorship, the number of citations per article, etc.

Dhiman (2011) used ten volumes of Ethnobotany Journal from 1999 to 2008 to carry out its bibliometric study. The length of papers, citations per article, authorship patterns, and other factors are studied. The outcomes have also been juxtaposed with those of the Dhiman (2000) study, which was carried out for an additional ten years, from 1989 to 1998, for the Ethnobotany journal.

Nongrang and Tariang (2013) carried out a bibliometric analysis on the botany faculties to manage journal collection in North Eastern Hill University Library by gathering information from Web of Science. The study focused on the number of publications by NEHU faculty members who teach botany, along with the nature of authorship patterns, author productivity, and the identification of core journals in the field of botany by applying Bradford's and Lotka's laws, respectively. A total of 1218 articles published in 263 journals were collected for the study. The data analysis reveals that the growth of literature is inconsistent, with varying numbers of publications. Nevertheless, the greatest number of publications - 24 out of 154, were published between 2009 and 2010, accounting for 15.58 percent of the total. Additionally, it is shown that the top 61 (39.61%) papers with three authors have been on the list for the past ten years. The results of the investigation indicated that the observed percentage of writers differed from the expected percentage of

authors as predicted by applying Lotka's equation. Specifically, 22 authors earned one citation apiece, while another 22 received two citations.

Dhiman (2015) also examined "Bibliometrics of Ethnobotany," where he analysed numerous publications relevant to various domains of bibliometrics, discussed the history of bibliometrics, and conducted citation analysis. Furthermore, based on the 20 years' worth of yearly volumes of the Ethnobotany journal, ranking lists for the most popular journals, authors, publications, etc. are listed in this work.

A citation based bibliometric analysis was carried out by Dhiman and Rehman (2022) using two issues of 2020 of Bulletin of Pure and Applied Science Section-B (Botany). Current study shows that 97.20 percent of botanists publish their articles and research papers in English. The majority of authors (43.86%) prefer to write research papers and articles as a single author; however, 24.86 percent of authors prefer to write as many authors. Additionally, as journals are cited more frequently from the 2001-2010 decade than books from the earlier 1981-1990 decade, they wish to highlight newer journals more frequently. However, they do also identify texts that are 41-50 years old.

Dhiman (2022) conducted a bibliometric analysis of Indian Fern Journal, a pioneering publication in the subfield of botany, in order to investigate the sources that the Pteridologists wish to cite. Its several issues from number 33 (2016) to volume 37 were used to gather primary data for studies. The results of the study show that two-authored publications (39) constituting 30.70% to the total number of articles, is the highest contribution, while single author contribution is very low. It is also seen that maximum number of articles (58) are finishing in 06-10 range of paper which constitute to 45.66% to the total articles. It is followed by 11-15 range of paper of the articles with 18.11% that consists of 23 articles. And least number of articles is 1 that comprises of 41-45 range of paper length. Further, most of the articles/ research papers are finished within 11-20 and 21-30 reference limits. They are 28 plus 33 in number and if average is calculated it comes to 61 among total 127 articles that is around 48.03%. Thus, it can be said that the journal publishes primary research-based articles in majority; however, many papers are of review type in nature too are there.

OBJECTIVES OF THE STUDY

The major objectives of the present study are:

- To ascertain year wise and volume wise number of articles.

- To ascertain authorship patterns of contribution.
- To ascertain volume wise authorship pattern of contribution.
- To ascertain year and volume wise degree of collaboration of authors.
- To know the state wise contribution of the articles.
- To ascertain country wise foreign contribution of the articles.
- To know the most productive authors of the journal.
- To ascertain the average length of the articles.
- To ascertain the average number of references per article.

SOURCE JOURNAL FOR PRESENT STUDY

Environment Conservation Journal is an open access and peer-reviewed journal that is published by Action for sustainable Efficacious Development and Awareness (ASEA). It gives a platform for researchers and scientists to publish scientific research views in the field of agriculture, biological and environmental sciences to promote the speedy propagation of quality research information. The journal encourages submission of two categories of papers- the first category comprises scientific papers and the second category comprises engineering papers. The study of the environment is inherently multidisciplinary. Therefore, the journal publishes a wide range of topics (<https://environcj.in>). Table 1 presents various subjects of study being covered in this journal.

Table 1: Various Subjects Covered in the Journal

Agriculture	Animal Physiology
Ayurveda	Botany
Environmental Pollution	Environmental Modeling
Environmental Microbiology	Environmental Ethics
Environmental Management	Environmental Policies
EIA/Environmental Legislations	Ethnobotany
Ethno Zoology	Fish and Fisheries
Limnology	Toxicology
Occupational Safety and Health	Zoology

The major aim of this journal is to publish original research/review papers/ book reviews/ reports on

conferences/ seminars/ important events, news of interest/ information on forthcoming seminar/ books on the environment related aspects. Its five volumes are taken as the source journal for study in which 255 articles are contributed by environmental scientists during 2016-2020. This journal is published on quarterly basis where four issues come out in the market every year in the month of March, June, September and December respectively. Its ISSN is 0973-564X.

METHODOLOGY AND DATA ANALYSIS

The data collected from the last five volumes published are Environmental Science Journal during the period from 2016 to 2020. The data comprises of 255 articles published in these journal's issues. All the articles and its references are scanned and the data thus, obtained are tabulated and analyzed as per the objectives of the study.

Year Wise and Volume Wise Number of Articles

Table 2 shows the number of articles published in each volume of the Environmental Science Journal during 2016 to 2020. It is truly clear that a total of 255 articles were published in its last five volumes. The maximum number of articles 60 in its volume 18 that was published in the year 2017 constitutes 23.52% to total contribution made in the last five years in this journal. It is followed by 56 articles in its 19th volume with 21.96% of the total articles. However, the minimum number of articles 41 was published in the year 2019 comprising of 16.07 % in its volume 20.

Table 2: Year and Volume Wise Number of Articles

Year	Volume	Number of Articles	Article percentage
2016	17 (1-3)	48	18.82
2017	18 (1-3)	60	23.52
2018	19 (1-3)	56	21.96
2019	20 (1-3)	41	16.07
2020	21 (1-3)	50	19.60
Total	-	255	99.97 (100%)

Authorship Pattern of Contribution

Table 3 gives the details the authorship patterns of the article contribution made by the different categories of author time to time. A total number of 39 articles out of 255 articles are contributed by single author that comprises to 15.29%, on other hand 87 out of 255 articles are contributed by two authors comprise of 34.11%. Further, 57 articles out

of 255 were contributed by three authors comprising 22.35%. However, 72 articles are contributed by more than three authors that comprise 28.33% of the total contribution.

Table 3: Authorship Pattern of Contribution

Number of Authors	Article Contribution	Percentage
Single Author	39	15.29
Two Author	87	34.11
Three Authors	57	22.35
More than three Authors	72	28.33
Total	255	100%

Volume Wise Authorship Pattern of Contribution

Table 4 shows volume wise authorship pattern of contribution. It is clear that maximum 87 articles out of 255 are contributed by two authors and the

other hand the lowest number that is 39 out of 255, are contributed by single author.

If author wise statistics are seen then it can be seen that out of 39 contributions, 03 were contributed by single author in 2017 and maximum of 13 out of total 39 in the year 2020 that comprises to 07.69% and 33.33% respectively. Likewise, among two authors contributions, out of 87 contributions minimum of 11 with 12.64% are contributed in the year 2020 and maximum of 29 with 33.33% in the year 2017.

Further, out of 57 articles by three authors, 10 of them (17.54%) and maximum of 13 (22.80%) are contributed in 2019 and 2016 respectively. However, contribution by more than 03 authors is also significant that is 72 where minimum of 10 (13.88%) and maximum of 18 (25/.00%) are contributed in 2016 and 2017 respectively. Fig. 3 also presents the data analysis more clearly.

Year Wise Degree of Collaboration of Authors

The ‘Degree of Collaboration’ is known as the ratio of the number of collaborative research

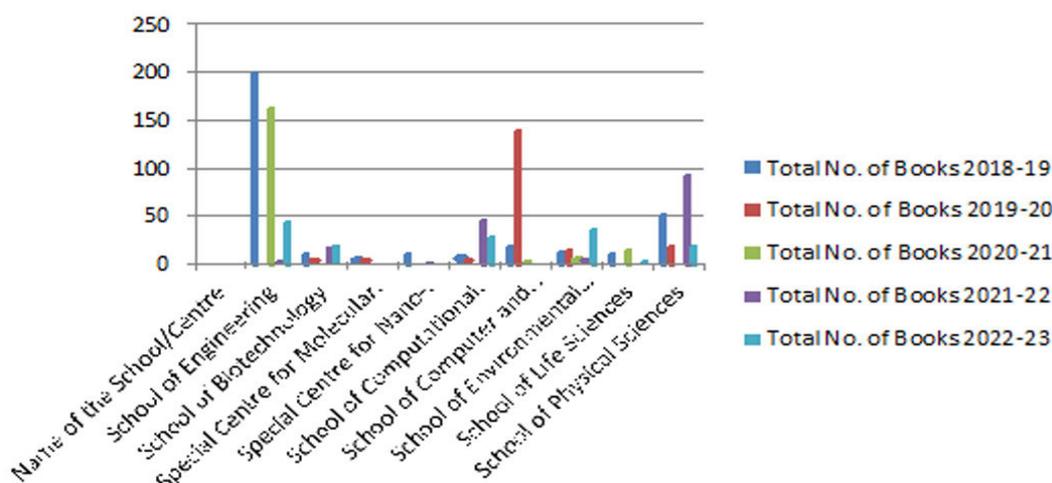


Fig. 1: Year and volume wise number of articles

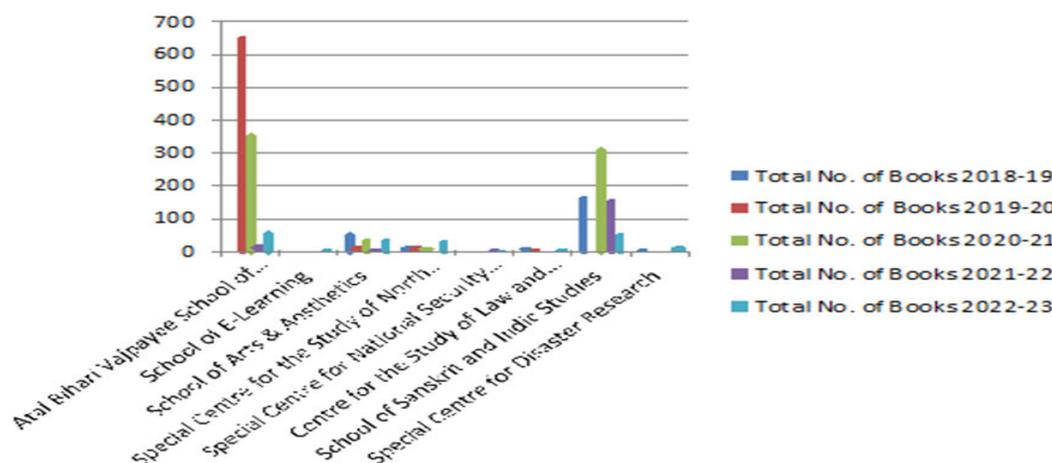


Fig. 2: Authorship pattern of contribution

papers to the total number of research papers in the discipline during a certain period of time (Subramanyam, 1983). Table 5 depicts year-wise degree of collaboration among the authors. It is seen from the table that it ranges from 16.67 to 23.92 that is seen in the year 2019 and 2017 respectively.

Further, year wise degree of collaboration is clearly shown through Fig. 4.

State Wise Distribution of the Articles

State wise contribution of the articles is given in table number 6 for the publications in last five-year journals. It may be seen from table 6 that out of 255 articles, maximum 89 (35.60%) contributions came from Uttarakhand and minimum of 0.40% articles comprising of 01 article each came from Andhra

Table 4: Volume Wise Authorship Pattern of Contribution

Volume Number	Year	Single Author		Two Authors		Three Authors		More than Three Authors		Total Articles
		No	%	No	%	No	%	No	%	
2016	17 (1-3)	10	25.64	12	13.79	13	22.80	10	13.88	45
2017	18 (1-3)	03	07.69	29	33.33	11	19.29	18	25.00	61
2018	19 (1-3)	08	20.51	22	25.28	11	19.29	14	19.44	55
2019	20 (1-3)	05	12.82	13	14.94	10	17.54	14	19.44	42
2020	21 (1-3)	13	33.33	11	12.64	12	21.05	16	22.22	52
	Total	39	99.99 100%	87	99.98 100%	57	100%	72	99.88 100%	255

Pradesh, Assam, Bihar, Jharkhand, Ladakh and Nagaland.

Uttar Pradesh with 35 (14.00%) articles remained in second position and Madhya Pradesh with 23 (9.20%) on third position respectively.

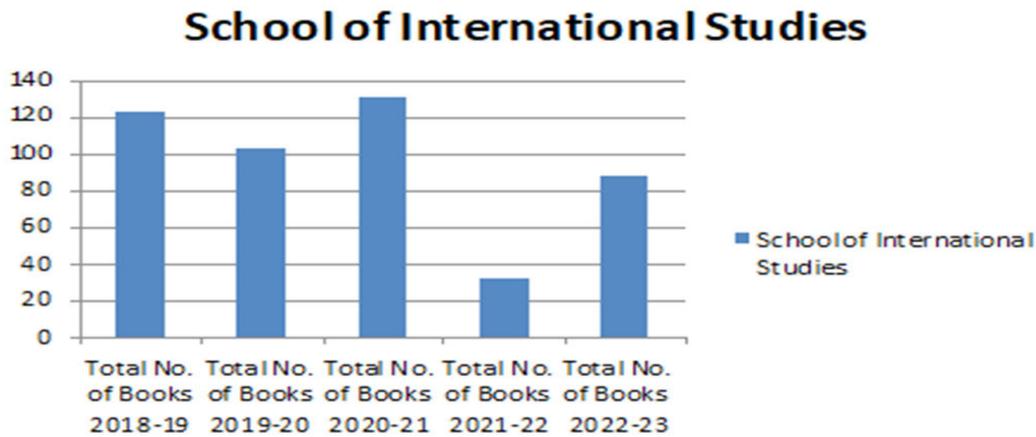


Fig. 3: Volume wise Authorship Pattern of Contribution

Table 5: Year Wise Degree of Collaboration among Authors

Year	Single Author	Two Author	Three Author	Multiple (Two+ Three Author)	Total	Degree of Collaboration
2016	10	12	13	10	45	17.64
2017	03	29	11	18	61	23.92
2018	08	22	11	14	55	21.56
2019	05	13	10	14	42	16.47
2020	13	11	12	16	52	20.39
Total	39	87	57	72	255	99.98=100

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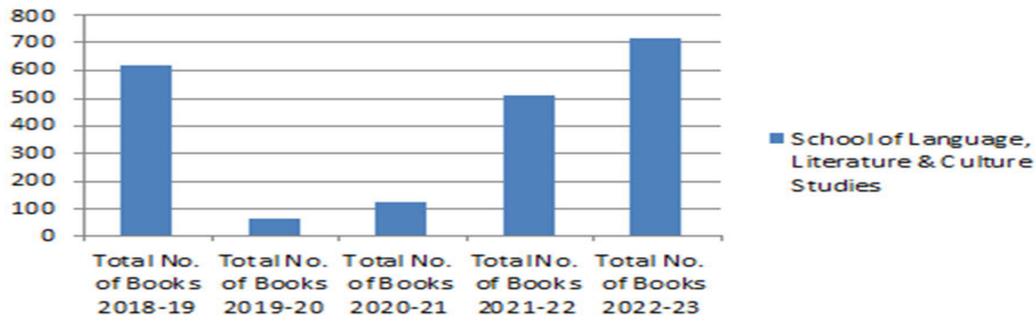


Fig. 4: Year Wise Degree of Collaboration

Table 6: State wise Distribution of the Articles

Name of State	Number of Contribution	Percentage
Uttarakhand	89	35.60
Uttar Pradesh	35	14.00
Madhya Pradesh	23	9.20
Jammu & Kashmir	22	8.80
Maharashtra	15	6.00
Rajasthan	14	5.60
New Delhi	12	4.80
Karnataka	11	4.40
Haryana	8	3.20
Telangana	8	3.20
Punjab	7	2.80
Himachal Pradesh	6	2.40
Gujarat	5	2.00
Kerala	5	2.00
Mizoram	4	1.60
Odisha	4	1.60
Tamil Nadu	4	1.60
West Bengal	2	0.80
Andhra Pradesh	1	0.40
Assam	1	0.40
Bihar	1	0.40
Jharkhand	1	0.40
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Country Wise Distribution of Articles

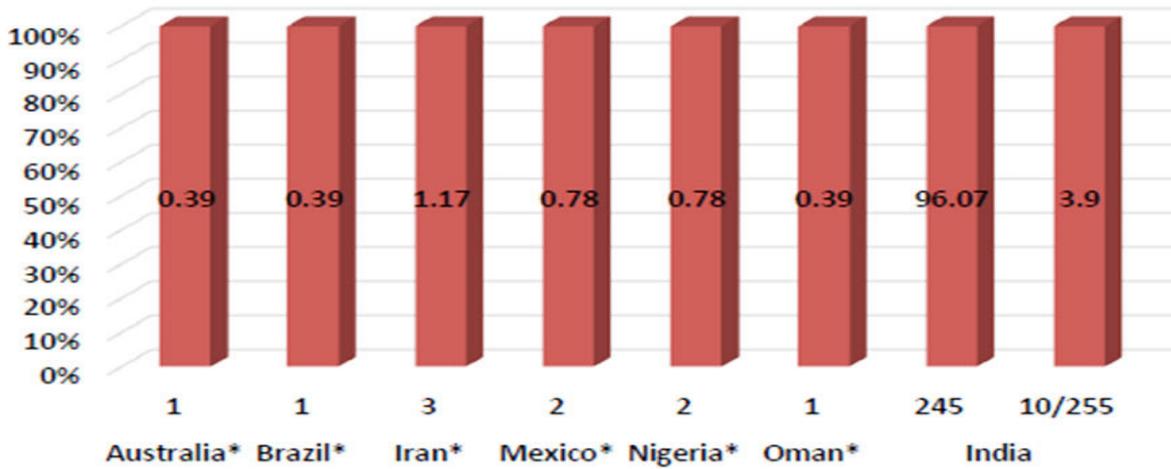


Fig. 6: Countries Wise Contribution

Country Wise Distribution of the Articles

The journal also publishes articles from foreign countries. Table 7 describes the details of the country from where the articles were published in the journal.

It may be seen from the table 7 that maximum contribution of 03 articles came from Iran and minimum of 01 each from Australia, Brazil, and Oman. However, 02 articles each are also contributed by the scientists from Mexico, and Nigeria. Thus, out of 255, 10 articles were received from foreign countries that comes to 03.90% contribution to total of the articles.

Fig. 6 also shows the details of countries who contributed articles in this journal.

Table 7: Country Wise Distribution of the Articles

Name of the Country	No. of Articles	Percentage
Australia	01	0.39
Brazil	01	0.39
Iran	03	1.17
Mexico	02	0.78
Nigeria	02	0.78
Oman	01	0.39
India	245	96.07
	10/255	3.90
Total	255	99.97=100

Most Productive Authors of the Journal

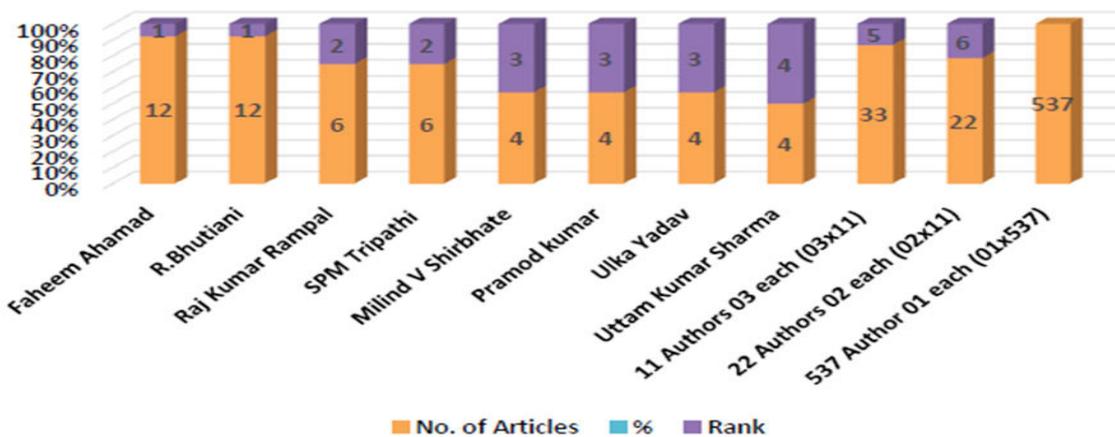


Fig. 7: Most Productive Authors of the Journal

Most Productive Authors of the Journal

It was noted in the study that a total of 255 articles were contributed by 600 authors, consisting of 12 contributions from 02 authors, 06 by 02 authors and 04 by 04 authors. Table 8 shows the rank wise most productive authors identified during the 2016 - 2020. However, among rest articles, 33 articles are written by 11 authors, 22 articles by 11 authors. 537 authors contribute rests of the articles singly.

Mr. Faheem Ahamad and Dr. Rakesh Bhutiani tops the list of authors with 12 articles each, followed by Raj Kumar Rampal, SPM Tripathi with 06 articles each.

Table 8: Most Productive Authors of the Journal

Name of Authors	No. of Articles	Rank
Faheem Ahamad	12	01
R. Bhutiani	12	01
Raj Kumar Rampal	06	02
SPM Tripathi	06	02
Milind V Shirbhate	04	03
Pramod kumar	04	03
Ulka Yadav	04	03
Uttam Kumar Sharma	04	04
11 Authors 03 each (03x11)	33	05
22 Authors 02 each (02x11)	27	06
537 Author 01 each (01x537)	537	-
Total	600	-

Average Length of the Articles

Table 9 describes the length of articles that have been divided into the four categories, viz., 0-5, 6-10, 11-15 and 16-20 pages during the period of 2016-2020. It is observed that the maximum number of articles 124 out of 255, comprising 43.92% are published in 5-10 pages of length.

Further, 91 (28.62%) articles each are finished in 0-5 pages and 31 articles (12.15%) in 15-20 pages length respectively. However, there are 09 articles (00.39%) that are published in 20-25 pages, comprising of 0.39%, which is the maximum length among all the articles published in last five years in the journal.

Table 9: Average Length of Articles

Range of the Pages	2016	2017	2018	2019	2020	Total	Percentage
00-05	23	17	26	13	12	91	28.62
05-10	17	35	22	21	29	124	43.92
15-20	04	08	05	06	08	31	12.15
20-25	04	00	03	01	01	09	00.39
Total	48	60	56	41	50	255	85.08

Thus, maximum contributions are completing of 05-10 pages which can be said for good research-oriented publication.

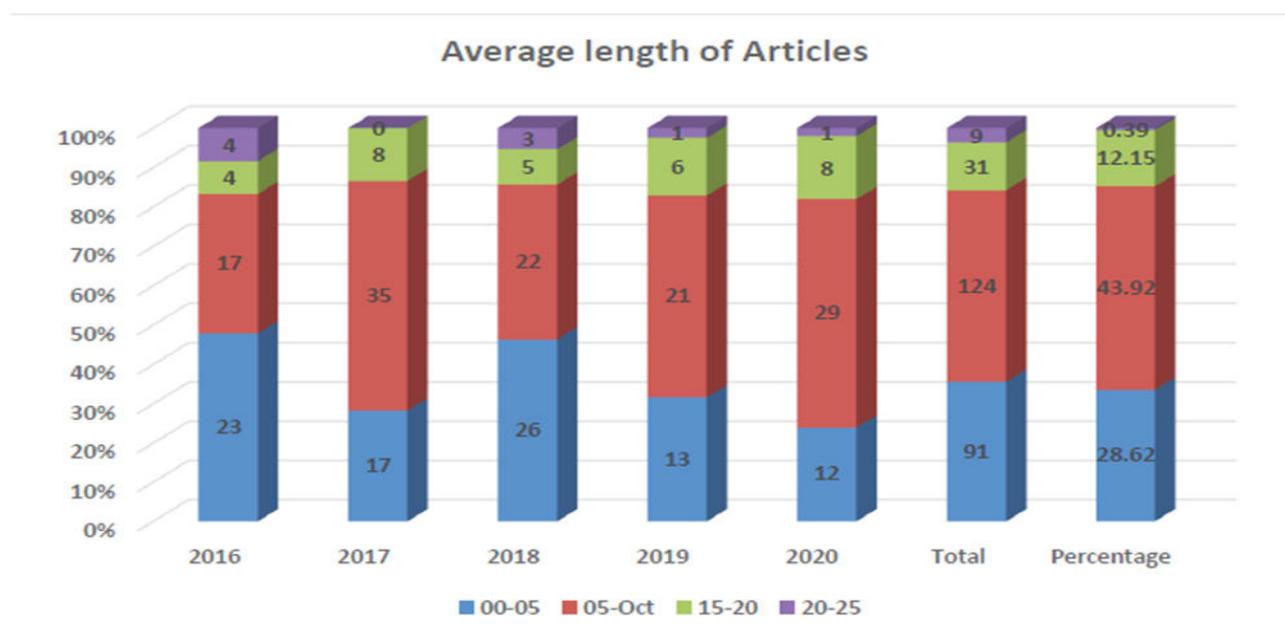


Fig. 8: Average length of Articles

Table 10: Average Number of References per Article

Range of the Pages	2016	2017	2018	2019	2020	Total	Percentage
0-20	24	27	27	23	27	128	50.19
20-40	18	28	20	13	16	195	37.20
40-60	03	03	06	02	05	19	07.45
60-80	02	02	01	04	00	09	03.52
80-100	02	02	01	04	00	09	07.80
100-120	00	00	00	00	00	00	-
120-140	00	01	00	00	01	02	07.80
Total	47	62	54	42	50	255	99.16 (100.00)

Average Number of References per Article

Table 10 depicts the average number of articles published in the last five-year issues of Environment Conservation Journal. It is very clear that most of the articles (128) consisting of 50.19% have 00-20 references per article; followed by 95 articles (37.20%) with 20-40 references and 19 articles (07.45%) with 40-60 references per articles.

However, there are 02 articles each which possess 80-100 and 120-140 references per article respectively. Thus, the majority of the articles are having 00-20 references per article which are good for the research articles.

RESULTS OF THE STUDY

The major results of the study are:

- The maximum number of articles 60 in year 2017 which constitute to 23.52% is to total contribution. However, the minimum number of articles 41 was published in the year 2019 comprising of 16.07% in its volume 20.
- Out of total 255 articles, 87 (34.11%) are contributed by two-authors followed by 72 articles more than 03 authors and 57 by three authors. While only 39 articles consisting of 15.29% are made by single authors. Thus, the maximum number of articles are written in collaboration that means environmental scientists want to write in collaboration.
- Out of 39 contributions, 03 were contributed by single author in 2017 and maximum of 13 out of total 39 in the year 2020 that comprises to 07.69% and 33.33% respectively. Likewise, among

two authors contributions, out of 87 contributions minimum of 11 with 12.64% are contributed in the year 2020 and maximum of 29 with 33.33% in the year 2017. However, contribution by more than 03 authors is also significant that is 72 where minimum of 10 (13.88%) and maximum of 18 (25/.00%) are contributed in 2016 and 2017 respectively.

- Collaboration among the authors ranges from 16.67 to 23.92% that is seen in the year 2019 and 2017 respectively.
- Among state wise contributors, the authors from Uttarakhand tops the list by contributing 89 articles (35.60%) Uttar Pradesh with 35 (14.00%) articles remained on second position and Madhya Pradesh with 23 (9.20%) on third position respectively.
- If talks about the foreign contribution, maximum contribution of 03 articles came from Iran and minimum of 01 each from Australia, Brazil, and Oman. However, 02 articles each are also contributed by the scientists from Mexico, and Nigeria. Thus, out of 255, 10 articles were received from foreign countries that comes to 03.90% contribution to total of the articles.
- A total of 255 articles were contributed by 600 authors, consisting of 12 contributions from 02 authors, 06 by 02 authors and 04 by 04 authors. Table 8 shows the rank wise most productive authors identified during the 2016-2020. However, among the rest articles, 33 articles are written by 11 authors, 22 articles by 11 authors. 537 authors contribute the rest of the articles singly.
- 124 articles out of 255, comprising 43.92% are published in 5-10 pages of length. Further, 91 (28.62%) articles each are finished in 00-05 pages and 31 articles (12.15%) in 15-20 pages length respectively.

• Most of the articles (128) consisting of 50.19% have 00-20 references per article; followed by 95 articles (37.20%) with 20-40 references and 19 articles (07.45%) with 40-60 references per articles. However, there are 02 articles each which possess 80-100 and 120-140 references per article respectively. Thus, most of the articles have 00-20 references per article which are good for research articles.

DISCUSSION AND CONCLUSION

On the basis of the results of the study, it can be concluded from the study that Environmental Conservation Journal seems to be a pioneer journal in the field of environment studies that is publishing articles on different sub-fields of environment science and botany. It is seen that most of the articles are written in collaboration as they are contributed by two, three and more than three authors. Further, the journal publishes research articles as 05-10 pages with 00-20 references per article seem to be good for a research article because original contributions possess less references and finish in less number of pages. Thus, it can be concluded that this journal is publishing original and research articles continuously.

It is hoped this journal is of immense value for environmental scientists in particular and for the students, professionals and the teaching fraternity in general for botanists, zoologists and other fields of study.

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