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## Research Productivity of LIS Women Faculty in India: A Bibliometric Study during 1988-2018

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## **Research Productivity of LIS Women Faculty in India: A Bibliometric Study during 1988-2018**

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### **Abstract:**

The current study conducted to quantify the research contribution of Library and Information Science (LIS) women faculty of India between 1988 and 2018. The study prepared an inclusive list of Indian universities offering LIS education by visiting its official websites individually and collected the names and other details of the LIS women faculties engaged in the teaching profession. The bibliographical data were extracted from the Scopus database during the year 1988-2018. Finally, a total of 146 research articles published by 38 LIS women faculty in India. The core findings of this study were the majority of research works published in journal articles followed by review articles, conference papers, and book chapters respectively. It was also revealed that LIS women faculty of India tend to publish more in an international platform than a national one. Dual authorship found dominating among the LIS women faculty of India. Further study revealed that P. Mahajan was the most productive LIS women faculty of India from Panjab University. The study result suggests that very small portion participations in research contributions as the current study surveyed 129 universities offering LIS education in India. However, many universities do not have a single LIS women faculty. The University Grants Commission (UGC) and the Ministry of Human Resource Development (MHRD) can take necessary measures to boost up the research productivity of LIS women faculty of India.

**Keywords:** Research Productivity, LIS Women Faculty, Bibliometric Analysis, Women Contribution, India

## **1.Introduction:**

Women are an indispensable part of any society. They play different roles in different settings of a male-dominated society. The European Commission, 2019 stated that “women are still under-represented in scientific authorship [10].” Further, the European Commission mentioned that women constitute only 32% of all publications as a corresponding author. In addition, women prefer to work with collaboratively at national level than international level. Further, study mentioned that the highest number of articles has been contributed by women researchers in the field of medical sciences and the lowest ratio of publications recorded in humanities and arts, engineering and sciences. Earlier librarianship profession was considered as one of the best suitable professions for women [7].

Writing a scientific paper and publishing in a reputed scientific journal is also a challenging job. The process of peer-reviewing of the scientific paper is also slow and time-consuming. The strict nature of peer review and editorial process of academic journals may be the factor of women’s less productivity of scientific publications [13]. The women feel more pressure to publish than men and only fewer women often struggle to overlook rude editorial rejections [6].

The gender studies of publications has been conducted by using different parameters like the authorship pattern, the chronological-wise, country-wise, gender-wise, ranking of journals among the librarians of institutions or universities, research scholars, LIS professionals, etc. of different countries or area. But the research contributions made by the LIS women faculty (academic) of India towards the growth of the subject have been remained unstudied. Therefore the need of this present study has been realized.

## **2.Objectives:**

The prime objective of the present study is to quantify the research contribution of the LIS women faculty of India who are engaged in teaching and indexed by Scopus database during 1988-2018. The other objectives of the study are as follows:

- I. What is the growth of literatures published by the LIS women faculty of India?
- II. What are the various forms of research literatures contributed by the LIS women faculty of India?
- III. Which types of publication are preferred by the LIS women faculty of India?
- IV. What is the portion of literature published in both national and international by LIS women faculty of India?
- V. Who is the most productive author among the LIS women faculty of India?

- VI. What type of authorship patterns are found among the LIS women faculty of India?
- VII. Which is the most favourite source of journal among the LIS women faculty of India?
- VIII. Which are the most top cited papers published by the LIS women faculty of India?
- IX. How co-citation network represents the published papers by the LIS women faculty of India?
- X. In which areas LIS women faculty do prefer to publish their work?

### **3.Review of Literature**

Academic publishing has become essential for faculty members and to get a promotion, an insignificant representation of women authors has affected the representation of women in the present academic publishing scenario. Various studies have been carried out to evaluate the research contributions of women in different disciplines globally [9],[22],[1],[23],[5]. The male LIS authors were publishing considerably more than women authors and there was a “significantly difference in the number of contributions by both male and women authors engaged in different LIS professions [5].” The male scholars are in a leading position as compared to women [13]. Since 1990, women represent only 26% of single-authored papers in the JSTOR dataset [25]. Surprisingly, the lower scientific publication of women in their dominant disciplines has also been witnessed [4]. Out of 14 disciplines, the citation rate of male researchers is relatively higher than women researchers in 9 disciplines. Moreover, reported that the women researchers are cited more in Geosciences, Physics, Chemistry, and Computer Sciences/Informatics [2]. Men published at a higher rate literature than women. Further, it also reported that both men and women give references to the articles authored by men [20]. The male scientists are producing more papers than the women counterparts and “the total scientific and professional career production by women is two-thirds of the production by men (67.9%) [19].” However, observed that there was an increased in research productivity of women authors especially in Life Sciences over the last 21 years and the quality of research output remains the same regardless of sex; i.e., male or women [15]. The women’s participation in Poland in scientific production was in static nature during 1980-1990 [24]. SCI also shows that there was a significant difference between the number of women professionals and their research output. The rate of research productivity of male anaesthesiologists increases in their early-career phase than women in the US. On the other hand, the rate of research productivity of women is more productive in their mid-career which is equalled and even surpassed the male colleagues [18]. A total 75,887 LIS research articles extracted from SCOPUS database, where the USA has contributed highest 29,349 number of publications and India contributed only

1,314 publications towards LIS research in the world during 2004-2013 [16]. examined LIS articles published in the Electronic Library journal during 2005-2014 from gender perspectives. Occupational impact has been clearly seen on the research productivity of LIS professionals. It revealed that male authors who are working as teacher or faculty members are more productive. On the other hand, women authors are more productive working either as professionals or as pursuing academic or research degrees. No significant difference has been found in author collaborations, but the majority of research works published by opposite gender duos[11]. However, there is no significant study conducted at LIS women contribution in India. Hence, this study has conducted to fill the gap.

### **Method:**

Different methods have been proposed to measure women's contributions to the academic world. In this study, authors used a bibliometrics method to measure women's contribution which has been recognized worldwide. To address the research contributions of LIS women faculty, first compiled the comprehensive list of LIS departments in India by visited each Government university website. Further, the study only considered those women faculties' names, listed on the university websites [11]. During the data collection, a total of 129 universities of India offering LIS education has been surveyed [12]. There were only 144 LIS women faculty found, out of which only 38 LIS women faculty contributed 146 papers. Further, bibliographical data were extracted from the Scopus database date: 25-09-2019 using "Affiliation Search" filtered and find out the name of the authors. Scopus is the largest abstract and citation database of the world. In this study the Scopus database used as it provides wider access to millions of peer reviewed journals, books and conference proceedings than other databases like Web of Science (WoS) [21], [14], [17]. To analysed the research publications authors used bibliographical data visualization tool namely VOSviewer software, R-programme (Bibliometrix package) and Microsoft Excel [3],[8].

### **Data analysis**

#### **Summary of total research contribution**

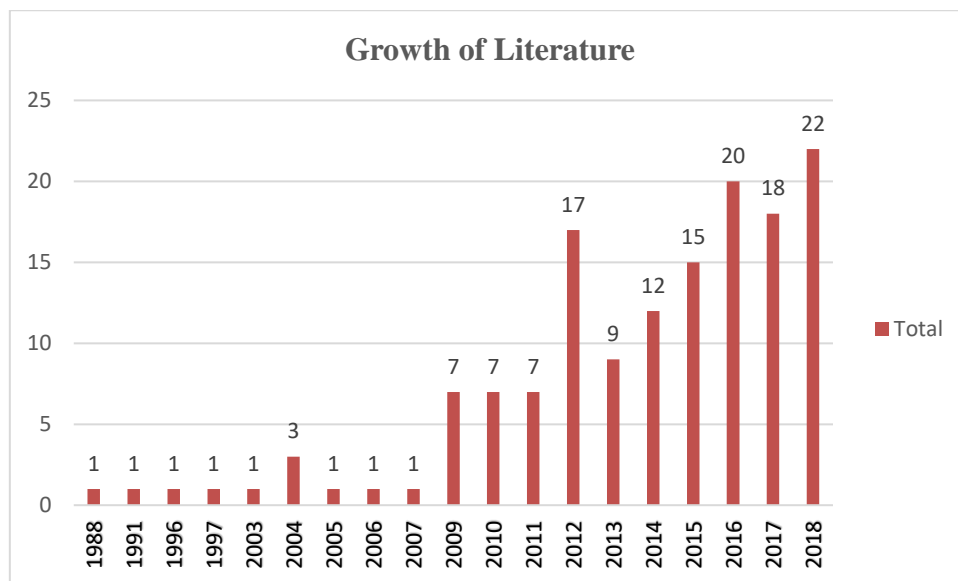
Table.1 summarizes the total number of research contributions of LIS women faculty in India between 1988 and 2018. In this study, a total of 146 documents reviewed published by 38 LIS women faculty. The study found 51 unique sources; it includes books chapter, conference papers, and articles, etc where, LIS women faculty preferred to publish their papers. Further, 257 unique keywords used in 146 documents during 1988-2018.

Documents	146
Sources (Journals, Books,etc.)	51
Author's Keywords	257
Period	1988-2018

Summary of Publications Table.1

### Growth of Literature

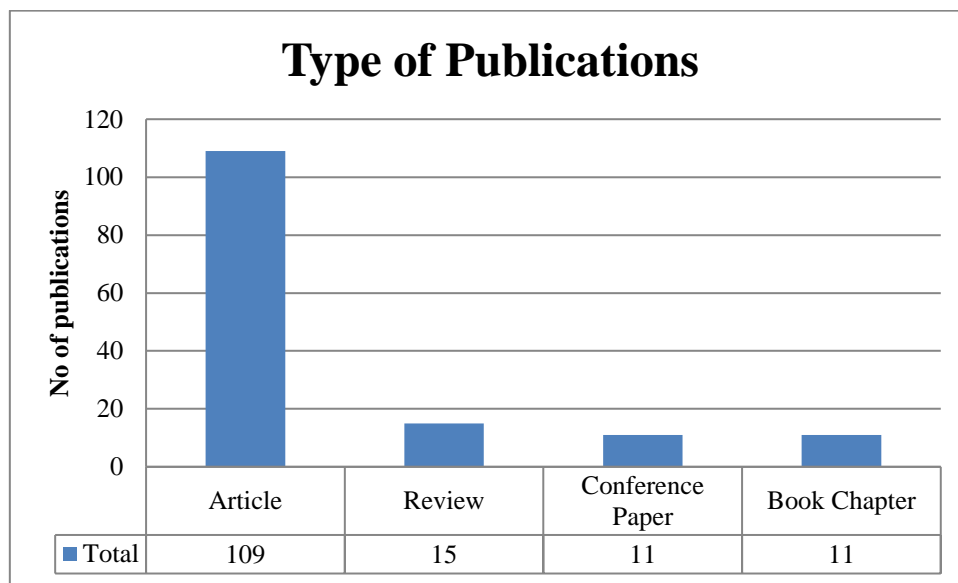
Figure.1 shows the research trends of literature published by LIS women faculty in India from 1988 to 2018. A total of 146 original publications found between 1988 and 2018. However, an overall trend of the research contributions was not stable over time the growth rate was fluctuated. It can be seen that in the beginning 1988 to 2011 the publications rate was only single digits, while in the year 2012 one burst can be seen and publications rate increased from single-digit two digits with 17 publications. Again the publication rate was dropped. However, from 2014 to 2016 growth rate of publications was upward and aging 2017 it was slightly down. Conversely, the highest 22 number of publications published in the year 2018.



Growth of literature Fig. 1

## Type of Publications

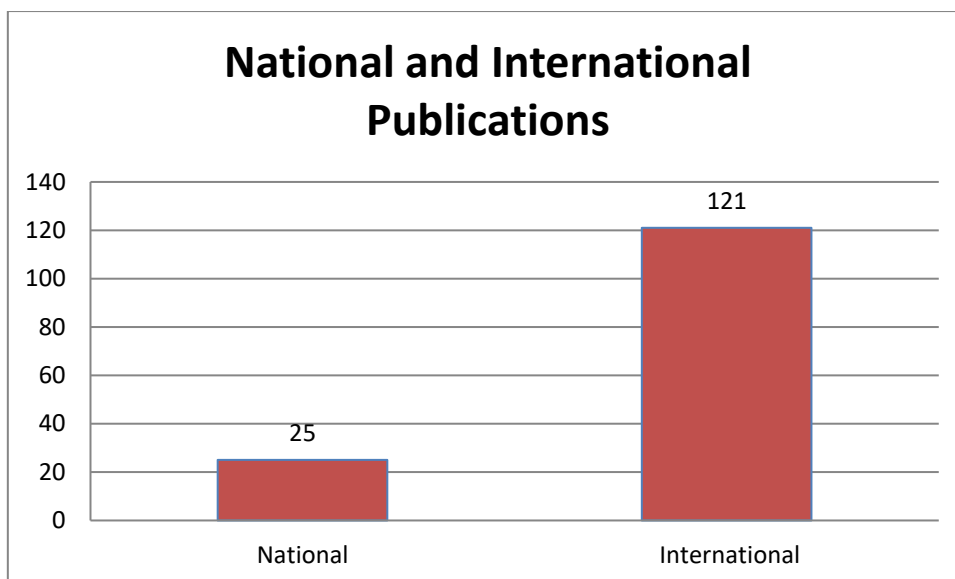
The distribution of publications by type of document can be seen in Figure.2. It shows that a vast majority of 109 publications found in the form of research articles than 15 reviews while conference papers and book chapters each 11 published during 1988-2018. However, there was no book published by LIS women faculty. Furthermore, noted that more than one third of the contributed by LIS women faculty research in the form of journal articles.



Type of Publication Fig. 2

## National and International Publications

The distribution of published documents by national and international level is presented in Fig. 3. It was found that LIS women faculty published more than one third 121 documents of published at international level journals, books chapter and other types of publications whereas very less 25 documents published at the national level. LIS women faculty preferred to publish their research contributions at an international level rather than the national level.



**National and International publications Fig. 3**

### Most Productive Authors

Table 2 lists the most productive authors with their number of publications. The data were sorted by the highest number of publications. It was found that Mahajan, P, from Panjab University Chandigarh contributed the highest 29 number of publications, it was followed by 20 Sawant S, SNDT Women's University and 08 Sahoo J, Sambalpur University. Further, data informs that only two authors touched two digits in terms number of publications from the most productive authors table while other authors only single digit.

SI No	Authors	Document
1	Mahajan P	29
2	Sawant S	20
3	Sahoo J	8
4	Lihitkare Sr	7
5	WaliaPk	7
6	Kanjilal U	5
7	Kavitha ES	5
8	Kumar A	5
9	Parvathamma N	5
10	Shrivastava R	5
11	Arora M	4
12	Banerjee S	4
13	Jena P	4
14	Kaur H	4

Most Productive Authors Table.2



### **Authorship pattern:**

Distribution of authorship patterns can be seen in Table.3. Total 171 unique authors found in 146 documents. Where, more than half of the document published collaboratively where 69 documents published by double authors and 22 documents published three authors, whereas only 8 documents wrote by more than three authors. While, 47 publications written by single authors. From the presented data, it was noted that LIS women faculty preferred to write papers in collaboration with other authors than independently.

Authorship Pattern	Document
Total Authors	171
Single Author	47
Double Authors	69
Three Authors	22
More than three Authors	8

Authorship pattern Table.3

### **Favourite source Publications**

Table.4 gives information about the favourite's source of publications where LIS women faculty contributed their maximum number of publications. LIS women faculty published their research output in 51 unique sources. In which, the majority of 31 (21.2%) publications published in Library Philosophy and Practice followed 31 (21.2%) by Library Hi Tech News 17 (11.6%) and DESIDOC Journal of Library and Information Technology 16 (11%) out of 146 publications. It was further noted that LIS women faculty preferred to publish papers in various international journals rather than Indian journals. In terms of the number of articles, Library Philosophy and Practice was the foremost source of publications. It can be said that LIS Women faculty preferred to publish in these journals than others.

Sl No	Source title	Document	%
1	Library Philosophy and Practice	31	21.2
2	Library Hi Tech News	17	11.6
3	DESIDOC Journal of Library and Information Technology	16	11.0
4	Annals of Library and Information Studies	7	4.8
5	Library Review	5	3.4
6	Collection Building	4	2.7
7	International Information and Library Review	4	2.7
8	Scientometrics	4	2.7
9	Digital Information Exchange: Pathways to Build Global Information Society	3	2.1
10	IFLA Journal	3	2.1
11	Managing Knowledge and Scholarly Assets in Academic Libraries	3	2.1

Favourite source Publications Table.4

### Top Cited Paper

Table.5 gives information about top-cited publications. A total of 146 documents were examined in this study. It was found that the title“Impact and use of e-resources by social scientists in national social science documentation centre (NASSDOC), India” by Haridasan S., Khan M. has received highest 33 citations. Further, data informs that all the top-cited publications published in the journal other than, book, book chapter and conference proceedings. However, indebt evaluations of paper and citation shows that these highly cited artless were written by single authors rather than collaborative works. 8 papers were published by independently and majority of publications related to quantitative study and user study.

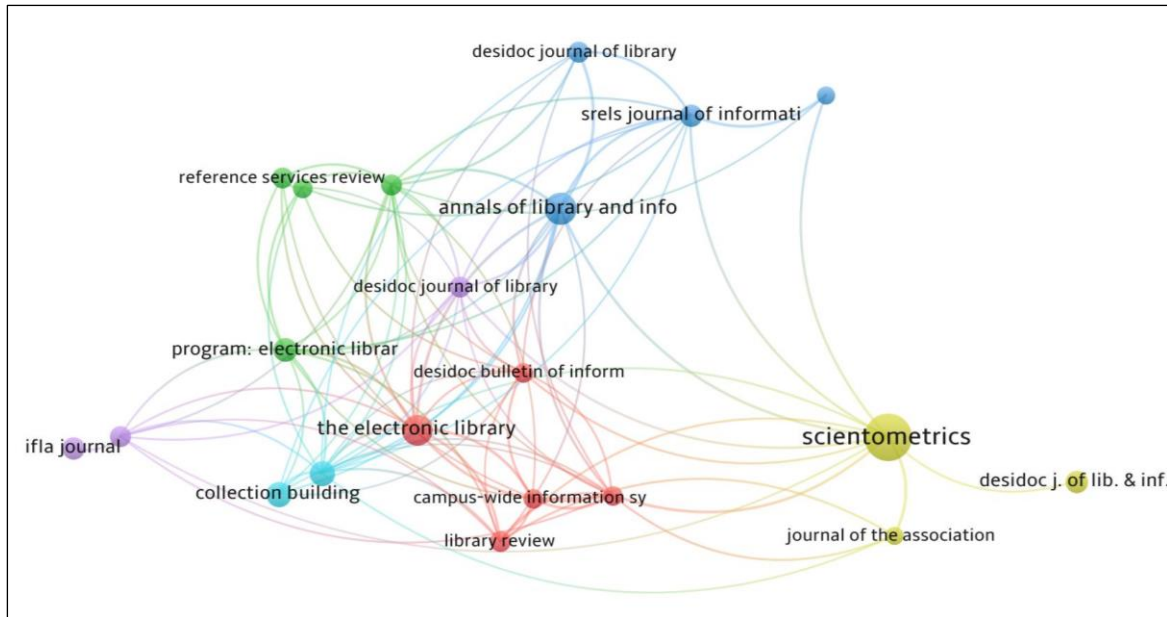
Sl No	Authors	Title	Year	Source title	Cited by
1	Haridasan S., Khan M.	Impact and use of e-resources by social scientists in national social science documentation centre (NASSDOC), India	2009	Electronic Library	33
2	Mahajan P.	Internet use by researchers: A Study of Panjab University, Chandigarh	2006	Library Philosophy and Practice	17
3	Sawant S.	The study of the use of Web 2.0 tools in LIS education in India	2012	Library Hi-Tech News	16
4	Mahajan P.	Use of social networking in a linguistically and culturally rich India	2009	International Information and Library Review	15

5	Sawant S.	Indian institutional repositories: A study of user's perspective	2012	Program	13
6	Gule S., Nisa N.T., Shah T.A., Gupta S., Jan A., Ahmad S.	Middle East: research productivity and performance across nations	2015	Scientometrics	11
7	Shrivastava R., Mahajan P.	Relationship amongst ResearchGate altmetric indicators and Scopus bibliometric indicators: The case of Panjab University Chandigarh (India)	2015	New Library World	11
8	Begum K.J., Sami L.K.	Research collaboration in agricultural science	1988	International Library Review	9
9	Mahajan P.	Academic libraries in India: A present-day scenario	2005	Library Philosophy and Practice	8
10	Haridasan S., Kulshrestha V.K.	Citation analysis of scholarly communication in the journal Knowledge Organization	2007	Library Review	8
11	Sawant S.	Institutional repositories in India: A preliminary study	2011	Library Hi-Tech News	8
12	Patel D.	Research data management: a conceptual framework	2016	Library Review	8
13	Hirwade M.A.	Responding to information needs of the citizens through e- government portals and online services in India	2010	International Information and Library Review	8

Top Cited Paper Table.5

### Co-citation Network of Journals

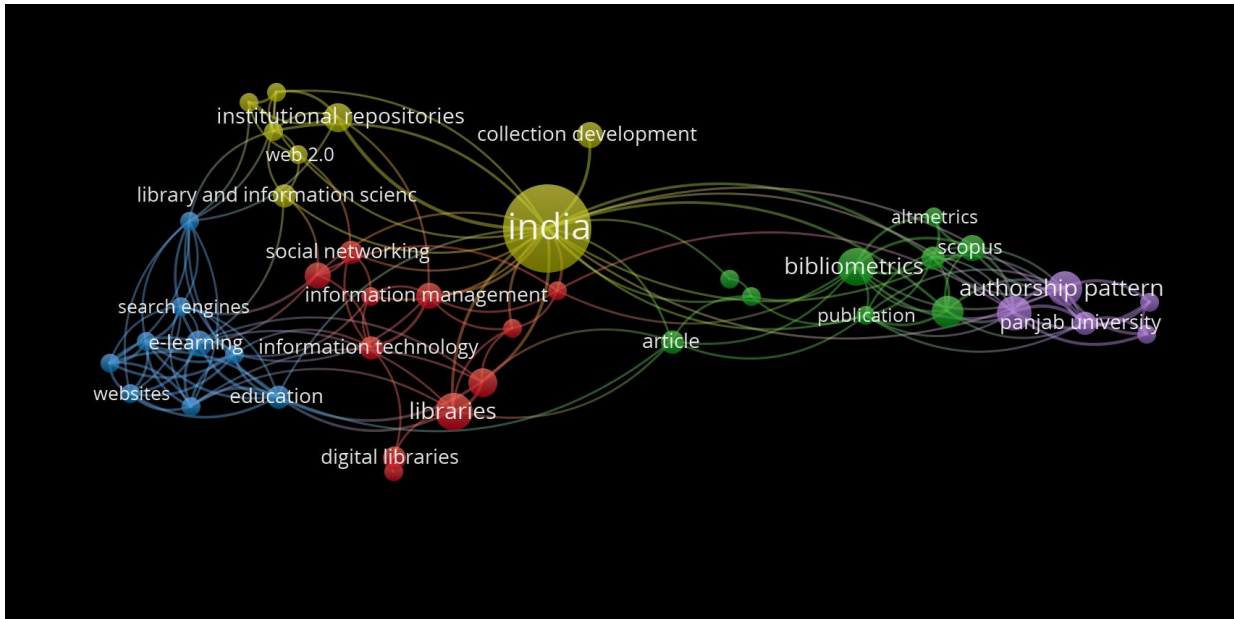
The Co-citation Network of Journals can be seen in figure 4. The Co-citation Network of Journal made using VOSviewer software. This network diagram represents how they co-cited in the papers published in different journals. Further, the size of the nodes represents the larger weight of items whereas edge size of presents strong relation between two nodes. And colour presents clusters. It is very clear that mostly cited source was “Scientometrics” journal, Further, the figure depicts that, LIS women faculty frequently cited paper published in Annals of Library and Information Science, Electronic Library, Collection Building, and Library Management. Further noted that Scientometrics and Journal of the Association for Information Science and Technology were strong co-citations relation.



**Co-citation Network of Journals Fig. 4**

### **Keywords Network**

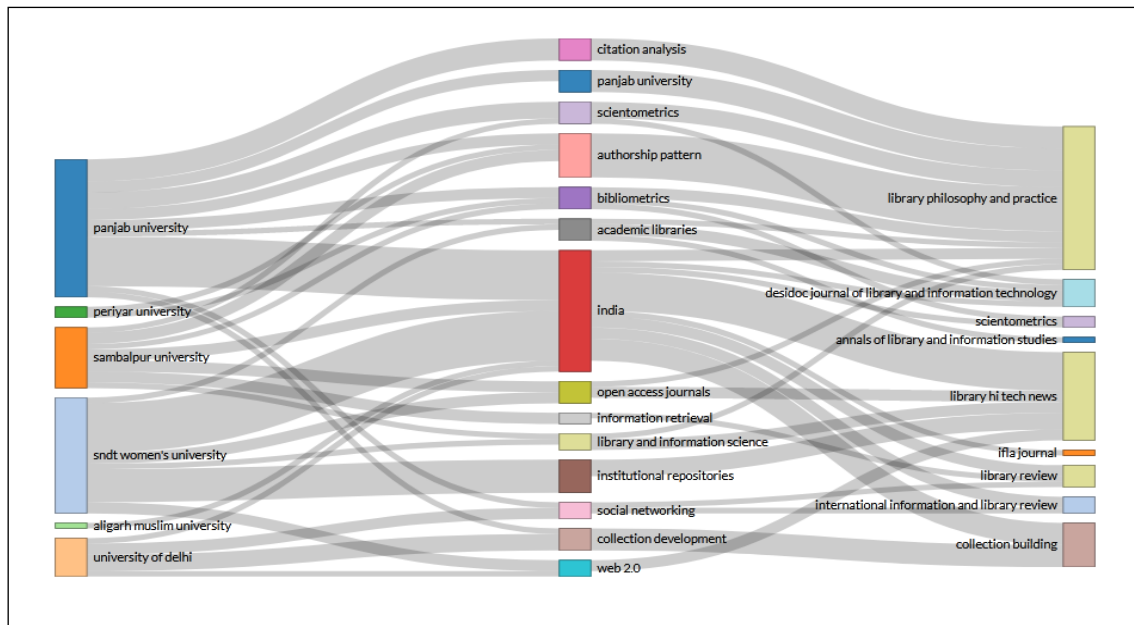
Keywords network was drawn by extracting most frequently keywords from author's keywords. In this analysis, authors analysed frequently used keywords. Figure 5, it can be said that LIS women faculty frequently used keywords in their papers. Further, how, a particular keyword was used and correlated with other keywords. It is clear from the below figure that the word "India" more frequently used in their papers. Similarly, words like bibliometrics, authorship pattern, citation analysis, and libraries were more frequently used. It was noted that LIS women faculty were more likely to writes papers on "India" and closely related to the papers on "Bibliometrics" and "Authorship Patterns".



**Keywords Analysis Fig. 5**

**Three Fields Plot Analysis:**

The Three Fields Plot Analysis had done using R-programme(Aria & Cuccurullo, 2017). It calculates the broad areas and compares how they are connecting. Figure.6 compared three main areas such as organization, keywords and source journals. It is clearly shown that the main areas of research works related to India as board area further, this research outcome came from Panjab University and SNDT Women University and further, this research were published in Library hi-tech and Collection Building journals. Similarly, the second dominant areas were related to bibliometrics and Scientometrics areas. As the figure shows that, researchers frequently used Citation analysis and authorship patterns. And the same research work prefers to publish in Library Philosophy and Practice rather than other journals. Further, the figure informs that Punjab University prefers to publish research papers on bibliometrics and Scientometrics likewise Sambalpur University contributed major research outcome on Authorship patterns, open access journals and information retrieval. Furthermore, SNDT Women University Published more papers related to India and Institution repository.



**Three Fields Plot Analysis Fig.6**

### Discussion and Conclusion

The present study analyses the research articles published by the LIS women faculty of India during 1988-2018. Out of 144 LIS women faculty engaged in the different universities of India, However, only 38 LIS women faculty had at least one publication in Scopus database. It is found that only 26.39% of the whole population taken active participation in scientific production. The growth rate of literature of women LIS faculty of India during 1988-2018 was also found very slow. The maximum numbers of LIS research publications were published in the year 2018. Where, journal articles were the most preferred type of publications followed by reviews papers, conference papers, and book chapters. The study also showed that the LIS women faculty of India preferred to publish in international journals than in national one. Moreover, study depicted that P.Mahajan from Panjab University was the most productive LIS women faculty in India published the highest (29) number of publications. Further, it reveals that the dual authorship pattern has been recorded with the highest number of articles (69). Library Philosophy and Practice has been noted by the favourite's source of publication where LIS women faculty of India like to publish their research work. The paper titles "Impact and use of e-resources by social scientists in national social science documentation centre

(NASSDOC), India” by Haridasan S., Khan M. has received the highest number of 33 citations. "Scientometrics" has been cited for the maximum number of times followed by "Annals of Library and Information Science", "The Electronic Library", "Collection Building" and "Library Management" by the LIS women faculty of India and strong co-citation relation between Scientometrics and Journal of the Association for Information Science and Technology. The most frequently used keywords by the LIS women faculty of India are "India", "Bibliometrics", "authorship pattern", "citation analysis", etc.

The lower participation of women in research activities irrespective of any discipline or field has been witnessed by the world. In this study same kind of result has been observed in research. The results of study suggest that, various programs should introduce by the concerned authorities to reduce the gender gap in research and development areas all over the world. Therefore, many developed countries are supporting women to increase their participation in research works by providing various research assistances and creating new opportunities.

The current study surveyed 129 universities offering LIS education in India. However, many universities do not have a single LIS women faculty. University Grants Commission (UGC) and the Ministry of Human Resource Development (MHRD) can take necessary measures to boost up the research productivity of LIS women faculty of India.

## References:

- [1] Abramo, G. and D'Angelo, C. A. (2015) 'Accounting for gender research performance differences in ranking universities', *Current Science*, 109(10), pp. 1783–1789. doi: 10.18520/v109/i10/1783-1789.
- [2] Aksnes, D. W. *et al.* (2011) 'Are Female Researchers Less Cited? A Large-Scale Study of Norwegian Scientists', *JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY*, 62(4), pp. 628–636.
- [3] Aria, M. and Cuccurullo, C.(2017), "Bibliometrix: An R-tool for comprehensive science mapping analysis", *Journal of Informetrics*, Vol. 11, No.4, pp.959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- [4] Barrios, M., Villarroya, A. and Borrego, A. (2013), "Scientific production in psychology: a gender analysis", *Scientometrics*, Vol. 95, pp. 15–23. doi: 10.1007/s11192-012-0816-4.

- [5] Bisaria, G. (2018), "DESIDOC Journal of Library and Information Technology: A Gender Perspective", *DESIDOC Journal of Library & Information Technology*, Vol. 38, No.6, pp. 410–415. doi: 10.14429/djlit.38.6.13238.
- [6] Boice, R., Shaughnessy, P. and Pecker, G. (1985), "Women and publishing in psychology", *American Psychologist*, Vol. 40, No.5 ,577-578. doi: 10.1037/0003-066X.40.5.577.
- [7] Brand, B. (1983), " Librarianship and Other Women-Intensive Professions", *The Journal of Library History*, Vol. 18, No.4, pp. 391-406. [www.jstor.org/stable/25541455](http://www.jstor.org/stable/25541455)(Accessed 24 March, 2020)
- [8] Centre for Science and Technology Studies, L. U. (2020), "VOSviewer Visualizing scientific landscapes".[www.vosviewer.com](http://www.vosviewer.com) (Accessed 25 March,2020)
- [9] Eloy, J.A., Svider, P.F., Cherla ,D.V., Diaz, L., Kovalerchik, O., Mauro, K.M., Baredes, S. And Chandrasekhar, S.S.(2013), "Gender disparities in research productivity among 9952 academic physicians", *The Laryngoscope*, Vol.123, pp.1865-1875.
- [10] European Commission (2019), "She Figures 2018" .Brussels, Belgium: Luxembourg.<https://op.europa.eu/en/publication-detail/-/publication/9540ffa1-4478-11e9-a8ed-01aa75ed71a1/language-en>(Accessed 25 March, 2020)
- [11] Gul, S., Shah, T.A., Hamade, S.N. and Koul, R.K.I.(2016), "Effects of gender in library and information science research: a case study of *The Electronic Library*", *The Electronic Library*, Vol.34, No.3, pp. 488-503.
- [12] Indian Library Association (2019), "Government Institutions Offering LIS Education in India".[https://www.ilaindia.net/index.php?option=com\\_content&view=article&id=15&catid=8&Itemid=111](https://www.ilaindia.net/index.php?option=com_content&view=article&id=15&catid=8&Itemid=111) ( Accessed 15 October 2019)
- [13] Kaw, M. A.and Ahmad, S. (2014), "Gender prejudice in the research world: Women researchers in a conflict zone, Kashmir", *Library Review*, Vol.63, No.s8/9, pp.684–699. <http://dx.doi.org/10.1108/LR-04-2013-0051>.
- [14] Kousha, K.and Thelwall, M. (2017), "News stories as evidence for research? BBC citations from articles, Books, and Wikipedia", *Journal of the Association for Information Science and Technology*, Vol. 68, No.8, pp.2017–2028. <https://doi.org/10.1002/asi.23862>



- [15] Lewison, G. (2001), “The quantity and quality of women researchers: A bibliometric study of Iceland”, *Scientometrics*, Vol.52, No.1, pp.29–43.
- [16] Pandita, R. and Singh, S.(2015), “Research growth in LIS during last decade: a study”, *Library Review*, Vol.64, No.8/9, pp.514-532.doi 10.1108/LR-04-2015-0037.j
- [17] Parabhoi, L. (2019), “Scholarly Publications of Academic Librarians in India from 1989-2018: A Bibliometrics Analysis”, *Library Philosophy & Practice (e-Journal)*, <https://digitalcommons.unl.edu/libphilprac/2789/>
- [18] Pashkova, A. A., Svider, P. F., Chang, C. Y., Diaz, L., Eloy, J. A. And Eloy, J. D. (2013), “Gender disparity among US anaesthesiologists: Are women underrepresented in academic ranks and scholarly productivity?”, *Acta Anaesthesiol Scandinavica*, Vol. 57, pp.1058–1064. <https://doi.org/10.1111/aas.12141>
- [19] Prpic, K. (2002), “Gender and productivity differentials in science”, *Scientometrics*, Vol. 55, No.1, pp. 27–58.
- [20] Reece-Evans, L. (2010), “Gender and Citation in Two LIS E-Journals: A Bibliometric Analysis of LIBRES and Information Research”, *LIBRES*, Vol.20, No.1, pp.1–18.
- [21] Scopus (2020), “What is Scopus Preview?”, [https://service.elsevier.com/app/answers/detail/a\\_id/15534/supporthub/scopus/#tips](https://service.elsevier.com/app/answers/detail/a_id/15534/supporthub/scopus/#tips).( Accessed 12 April 2020)
- [22] Sotudeh, H. and Khoshian, N.(2014), “Gender differences in science: the case of scientific productivity in Nano Science & Technology during 2005–2007”, *Scientometrics*, Vol.98, pp.457–472. Doi:10.1007/s11192-013-1031-7
- [23] Wininger, A.E., Fischer, J.P., Likine, E.F., Gudeman, A.S., Brinker, A.R., Ryu, J., Maupin, K.A., Lunsford, S., Whipple, E.C., Loder, R.T. and Kacena, M.A.(2017), “Bibliometric analysis of women authorship trends and collaboration dynamics over JBMR’s 30-year history”, *Journal of Bone and Mineral Research*, Vol. 32, No.12, pp.2405–2414.Doi: 10.1002/jbmr.3232.
- [24] Webster, B. M. (2001), “Polish women in science: A bibliometric analysis of Polish science and its publications, 1980–1999”. *Research Evaluation*, Vol. 10, No.3, pp. 185–194.
- [25] West, J. D., Jacquet, J., King, M. M., Correll, S. J., and Bergstrom, C. T. (2013), “The Role of Gender in Scholarly Authorship” .*PLoS ONE*, Vol. 8, No. 7e66212, pp. 1–6. <https://doi.org/doi:10.1371/journal.pone.0066212>