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Bibliometric Dimensions of Research in Social Sciences: An Empirical Analysis of Indian Central Universities

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Abstract:

This paper evaluates the performance of the 14 most productive Central Universities in Social Sciences research. The study is based on the Scopus Indexing database for the period from 2009 to 2018 where the total records retrieved were 7278. Results revealed that journal articles were the most preferred form of publication with 4293 (59%) research papers and the mean annual growth rate of publications was 1.01 while the Mean RGR (Relative Growth Rate) and DT (Doubling Time) were 0.314 and 2.751 respectively. The total number of citations received was 38456 with 5.77 mean citations per paper. Out of the total retrieved records, 4504 papers were cited and the share of open access citation was 71.9 percentage. Jawaharlal Nehru University (JNU), Delhi University (DU), and Aligarh Muslim University (AMU) emerged as the top three universities in Social Sciences research based on Total Publications (TP), Total Citations (TC), Highly Cited Papers (HCP), h-index and g-index. The p index of JNU, AMU, and DU are 35.68, 34.53, and 33.64 respectively. The mean of various bibliometric indicators namely, DC, CI, CC, and MCC were found to be 0.605, 2.306, 0.393, and 0.394 respectively. *Economic and Political Weekly* was the most prolific journal and R. H. Khan of AMU was the most productive author during the study period with 42 papers and with an h-index of 18.

Keyword: Social Sciences Research, Central Universities, Bibliometric Indicators, Authorship Pattern, Highly Cited Papers.

1. Introduction:

Higher Education (HE) is the most fundamental constituent, which demands careful attention and assessment to forecast forthcoming outcomes in a given country. Indian higher education

system is the third-largest in the world after the United States and China, and it has great potential to compete with global universities (Rienda & et al., 2011). Among all the Higher Education Institutions (HEIs) of India, the Central Universities play an important role in carrying out research, maintaining the balance between teaching and research, and creating innovative ways of linking research with teaching. In the process of indulging in research, students enhance their essential skills for creating, synthesizing, and gathering knowledge and information. The researchers get fresh insight into research conventions, habits, and simultaneously learn effective teaching skills (Raychaudhury, 2018). The performance of the institutions can be analyzed by a system inside or outside the institution. It is also essential for the institutions to know where it stands in the national or global scenario. Research and publications are one of the key factors for ranking by the Ministry of Human Resource Development (MHRD), Government of India. This parameter is described by the National Institute of Ranking Framework (NIRF) as research and professional practice (RP) which includes the combined metric for publications (PU) and combined metric for quality of publication (QP) (https://www.nirfindia.org/Parameter). There are various tools that are used to analyze the research productivity such as bibliometrics, scientometrics, informetrics, citation analysis, webometrics, etc. Among these tools, bibliometric analysis is the most popular and widely used technique to map research productivity. In this context, the present paper is modeled to map the productivity of Central Universities of India in Social Sciences research using various bibliometric indicators.

2. Literature Review:

A number of studies have been carried out to analyze the productivity of institutions, countries, and scientists using various metrics like growth metrics, collaborative metrics, and author/institute level metrics. As the present study is about mapping of Social Science Research (SSR) performance of selected Central Universities in India, studies related to this aspect are reviewed as follows.

Baskaran (2013) undertook the bibliometric study of Alagappa University during 1999-2011 based on the Web of Science database. An increasing trend in the productivity of Alagappan University is observed which increases from 31 publications in 1999 to 97 papers in 2011. RGR and DT are fluctuating and the mean DT is 0.96 during this period. The multi-authored papers (750 papers with 96.64% share) outnumber the single-authored papers (26 papers with 3.35%

share). Out of the total publications, 776 papers were published in Indian journals (73.69%), 97 papers from South Korea (8.83%), and 84 papers (7.99%) from Taiwan. Material Science, Physics and Chemistry are the most preferred subject areas producing 257, 208 and 157 papers respectively. **Kumar, Dora, & Desai (2015)** studied the bibliometric profile of Gujarat University based on the Scopus database. Total 760 numbers papers retrieved from the database during 2004-2013. Journal articles (631 papers, 83%) are found to be the most preferred form of publication used by the researchers. V K Jain was the most prolific author whereas 67% of the total papers were cited. **Nagarkar, Veer, & Kumbhar (2015)** explored the research productivity of faculty of the Department of Life Sciences of Savitribai Phule Pune University during the period from 1999-2013 based on the Web of Science database. Out of the total papers produced, 356 were on the subject area "Biology", BARC, Mumbai was the most collaborative national institute and among collaborative countries, USA contributed highest 41 papers with 590 citations and *Current Science* was the most preferred journal. **Singh (2013)** studied the research output of Banaras Hindu University in the field of Physics during 1970-2010. Decade wise growth is highest during 2001-2010. A total of 960 papers were published in the field of Condensed Matter Physics, 571 papers in Molecular Structure and Spectroscopy, and 324 in High Energy Particle Physics. Single author contribution is 348, three authored papers are 481. O.N. Srivastava was the most productive author with 348 papers (15.13%). *Spectro Chim Acta* was the most preferred journal with 35 publications. **Siwach & Kumar (2015)** carried research for Maharshi Dayanand University (Rohtak) for the period from 2000-2013 based on the Scopus database. The university produced 1247 papers with 6959 citations in 14 years of research assessment, ACPP is 5.58, Guru Jambeshwar University of Science and Technology, Hisar was the major collaborator at the national level and South Korea (66) and United States (26) were the major collaborative countries.

3. Objectives of the Study:

The objectives of the study are delineated as follows:

- To find out the distribution of papers as per the type of documents;
- To provide the year wise growth of publications ;
- To map the bibliometric profiles of the Central Universities in Social Sciences research ;
- To analyze the citation impact of publications by access type ;
- To calculate Relative Growth Rate (RGR) and Doubling Time (DT) of publications ;
- To study the authorship pattern of publications and 10 most prolific authors in SSR;

- To Identify the top 10 journals in SSR and
- To assess the country network and keyword network of SSR

4. Methodology:

4.1 Scope - The data for the current study was exported from Scopus Indexing Database using the affiliation search for the selected Central Universities. Only those Central Universities which has a publication count of more than 100 in the chosen disciplines have been included in the study. The filters that are used are, publication year (2009-2018), subjects covered are (Social Sciences, Economics, Econometrics, and Finance) and document types are (journal articles, conference papers, reviews, books, and book chapters).

4.2 Limitation - Out of the 54 Central Universities of India, this study is confined to 14 Central Universities where the publication count is more than 100. The time period of the study is one decade i.e. 2009 to 2018. Table-1 provides the list of Central Universities undertaken for the study.

Table 1: List of Central Universities Selected for the Study

University	Abbreviation	Location	Establishment Year
Aligarh Muslim University	AMU	Aligarh, Uttarpradesh	1920
Assam University	AU	Silchar, Assam	1994
Banaras Hindu University	BHU	Varanasi, Uttar Pradesh	1916
Indira Gandhi National Open University	IGNOU	New Delhi	1985
Jamia Millia Islamia	JMI	New Delhi	*1920 (1988)
Jawaharlal Nehru University	JNU	New Delhi	1969
North-Eastern Hill University	NEHU	Shillong, Meghalaya	1973
Pondicherry University	PU	Puducherry	1985
South Asian University	SAU	New Delhi	2010
Tezpur University	TEZU	Tezpur, Assam	1994
University of Allahabad	UoA	Allahabad, Uttar Pradesh	1887
University of Delhi	DU	New Delhi	1922
University of Hyderabad	UoH	Hyderabad, Telengana	1974
Visva-Bharati University	VBU	Santiniketan,West Bengal	**1921(1951)

**JMI was established in 1920 and received the Central University status in 1988.*

*** VBU was established in 1921 and received the Central University status in 1951.*

4.3 Development of a database and Data Analysis Tools used - In relation to the search criteria, a total of 7278 papers were retrieved from the Scopus database. The required metadata was incorporated into an excel sheet and the analysis is computed based on bibliometric indicators and aligning to the objectives of the study. VOSviewer Visualization tool was used to gain insight into the country network and network of keywords in SSR.

4.4 List of Indicators Used for Data Analysis - A wide range of bibliometrics indicators are used in the present study such as total publications (TP), total citations (TC), average citation per paper (ACPP), most citation (MC), participative index (PaI), annual growth rate (AGR), highly cited papers (HCP), h index, g index, performance index (p index), relative growth rate (RGR), doubling time (DT) degree of collaboration (DC), collaborative coefficient (CC), collaborative index (CI), modified collaborative coefficient (MCC), etc.

a) ***Highly Cited Papers (HCP)*** **-** The numbers of papers that have received citations of 50 or more than that, are considered as HCP for the present study.

b) ***Participative Index (PaI)*** $= \frac{\textit{No of papers generated in a country/institution}}{\textit{Total no.of publications in the repertoire}} * 100$

c) ***Annual Growth Rate (AGR)*** **–** It is calculated as per the following formula:

$$\textbf{AGR} = \frac{\textit{Publication of end year} - \textit{Publication of first year}}{\textit{Publication of first year}} * 100$$

d) ***Relative Growth Rate (RGR)*** **-** RGR is a measure to study the increase in the number of articles or pages per unit of articles or pages over a specific period. Mean RGR over a specific period can be expressed mathematically as:

$$R\ (P) = \frac{\textbf{Loge2P} - \textbf{Loge1P}}{\textbf{2T} - \textbf{1T}}$$

Loge1P = Log of the initial number of publications
Loge 2P = Log of the final number of publications
2T-1T = Difference between the final time and initial time

e) ***Doubling Time (DT)*** **-** Doubling time is the time required for articles to become double their existing or initial number. If the number of articles doubles in a given period of time then the difference between the numbers at

the initial time and final time must be the logarithm of 2 (Mohanty, 2014). For the natural logarithm, the value is 0.693.

$$\mathbf{DT} = \frac{\mathbf{Loge2}}{R} = \frac{0.693}{R}$$

f) ***h-index and g-index, p-index:*** The H-Index is a numerical indicator to assess how productive and influential a researcher is. A scientist has index 'h' if h of his/her Np papers have at least h citations each, and the other (Np-h) papers have no more than h citations each. Again for the same set of articles, g-index is the unique largest number such that the top 'g' papers received g2 citations together.

The p-index strikes the best balance between activity (total citations) and excellence (mean citation rate C/P).

$$\mathbf{p\ index} = \{C*(C/P)\}^{1/3} = (C^2P)^{1/3}$$

where, C=total citation, C/P is mean citation per paper

g) ***Degree of Collaboration (DC)*** **-** The ratio between the total numbers of multi-authored papers to the total number of papers is termed as Degree of Collaboration by Subramanyam (1983).

$$\mathbf{DC} = NM/(NM+NS)$$ where,

NM= Total no. of papers by multiple authors
NS= Total no. of papers by single authors

h) ***Collaborative Index (CI)*** **-** The measure of the mean number of authors per paper is the Collaborative index as computed by Lawani (1980) which can be mathematically expressed as follows:

$$\mathbf{CI} = \frac{\sum_{j=1}^{A} jfj}{N}$$ where,

fj=the number of papers having j authors in a collection of k
N=Total number of papers in k, $N=\Sigma jf_j$
A=Total number of authors in the collection k

i) ***Collaborative Coefficient (CC)*** **-** To overcome the shortcomings of CI and DC, a new indicator was formulated by Ajiferuke (1988) known as Collaborative Coefficient (CC) and can be mathematically expressed as follows:

$$\mathbf{CC} = 1 - \frac{\sum_{j=1}^{A}\left(\frac{1}{j}\right)fj}{N}$$ where,

N= Total number of research papers
j=No of j authored papers
A=greater no of j authored papers

j) ***Modified Collaborative Coefficient (MCC)*** **-** Savanur and Srikanth (2010) calculated the credit score for authors of papers with a different pattern of authorships. They gave 1credit to the author of a single-authored paper, ½ credit for each author of a double authored paper, 1/3 credit for each author of a triple authored papers, and so on. They coined the term MCC which is approachable to CC where A= ∞, otherwise less than MCC by the factor $\frac{A}{A-1}$.

$$\mathbf{MCC} = \frac{A}{A-1}\left\{1 - \frac{\sum_{j=1}^{A}\left(\frac{1}{j}\right)fj}{N}\right\}$$

5. Data Analysis and Interpretation:

In order to meet the objectives of the study, the dataset has been analyzed using various indicators and presented in Tables and figures. The total contributions of the selected central universities are 7278 papers which are 12.05% of the nationally contributed (60397) papers in the selected document categories in Social Sciences Research.

5.1 Document type distribution of papers

Table 2: Document Type Distribution of Publications

University	Article	Book	Book Chapter	Conference Paper	Review	Total	PaI
AMU	411	4	37	55	42	549	7.54
AU	91	3	16	6	7	123	1.69
BHU	271	8	72	35	18	404	5.55
DU	1096	69	436	69	176	1846	25.36
IGNOU	123	10	67	7	18	225	3.10
JMI	294	17	95	29	33	468	6.43
JNU	987	98	589	51	339	2064	28.36
NEHU	123	4	38	5	9	179	2.46
PU	198	4	22	16	12	252	3.46
SAU	76	7	33	3	17	136	1.87
TEZU	84	2	20	12	9	127	1.74
UoA	126	6	25	12	11	180	2.47
UoH	292	28	119	33	70	542	7.45

VBU	121	3	43	3	13	183	2.51
TOTAL	**4293 (58.99%)**	**263 (3.61%)**	**1612 (22.15%)**	**336 (4.62%)**	**774 (10.63%)**	**7278 (100%)**	**100**

From the document type distribution of papers (Table 2, Figure-1) it is observed that journal articles are the most preferred channel of communication which has the highest share (4293 papers, 58.99%) followed by book chapters (1612, 22.15%) and reviews (774, 10.63%). The PaI or the share of contribution is highest (28.36) for JNU, whereas for DU it is 25.36, and for AMU it is 7.5.

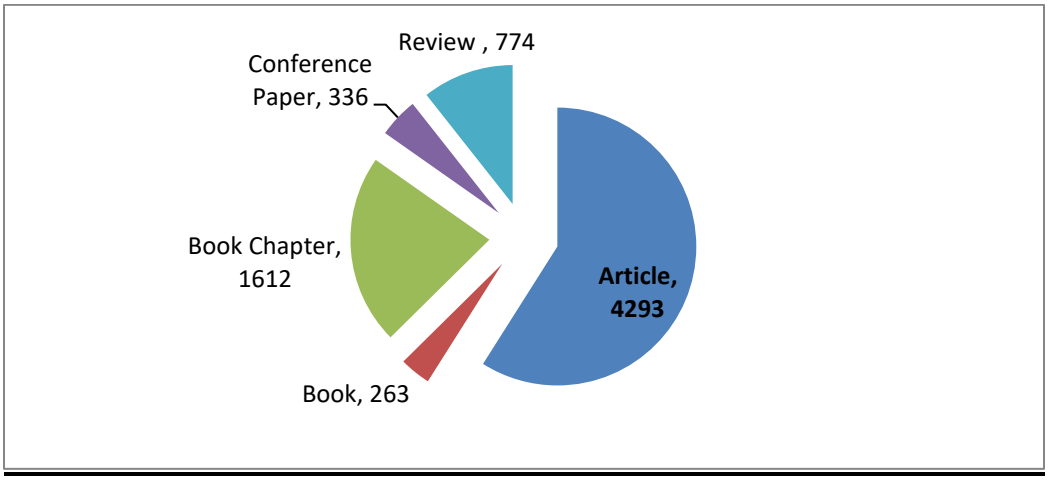

Figure – 1: Document types of publications

5.2 Year-wise growth of Publications

Table 3: Chronological growth of publications

Year	TP	% TP	AGR	TC	% TC
2009	430	5.91		3938	10.24
2010	504	6.92	0.17	4625	12.03
2011	497	6.83	-0.014	4035	10.49
2012	655	8.99	0.318	3532	9.18
2013	615	8.45	-0.061	3443	8.95
2014	680	9.34	0.106	4324	11.24
2015	772	10.61	0.135	3546	9.22
2016	936	12.86	0.212	3632	9.44
2017	1134	15.58	0.212	4070	10.58
2018	1055	14.49	-0.069	3311	8.61
Total	**7278**	**100**	**Mean 1.01**	**38456**	**100**

Table-3 depicts the year wise growth pattern of publications where it is reflected that the selected central universities altogether contribute 7278 papers during 2009-2018. The number of

publications has been increased from 430 in 2009 to 1055 in 2018. The growth pattern is showing an increasing trend except for the years 2011, 2013, and 2018. The mean annual growth rate is 1.01. The total citations received during this period is 38456, the highest citations (4625 citations, 12.03%) were received in the year 2010.

5.3 Bibliometric Profile of CUs

Table 4: Bibliometric Profile of CUs

University	TP	%TP	TC	%TC	ACPP	MC	HCP	h index	g index	p index
AMU	549	7.54	4755	12.36	8.66	252	16	31	48	34.53
AU	123	1.69	392	1.02	3.19	23	0	11	14	10.77
BHU	404	5.55	2631	6.84	6.51	318	5	25	39	25.78
DU	1846	25.36	8388	21.81	4.54	155	21	36	54	33.64
IGNOU	225	3.09	671	1.74	2.98	76	2	12	19	12.59
JMI	468	6.43	2791	7.26	5.96	246	6	24	37	25.53
JNU	2064	28.36	9684	25.18	4.69	954	26	38	65	35.68
NEHU	179	2.46	574	1.49	3.21	77	1	10	17	12.26
PU	252	3.46	1417	3.68	5.62	86	4	17	28	19.97
SAU	136	1.87	720	1.87	5.29	96	3	15	24	15.62
TEZU	127	1.74	1407	3.66	11.08	109	8	21	35	24.98
UoA	180	2.47	2054	5.34	11.41	482	5	22	39	28.62
UoH	542	7.45	2360	6.14	4.35	83	6	19	36	21.73
VBU	183	2.51	612	1.59	3.34	301	1	10	18	12.69
Total	**7278**	**100**	**38456**	**100**	**Mean 5.77**	**3258**	**104**	**Mean 21**	**Mean 34**	**Mean 22.47**

Table-4 analyzes the bibliometric profile of Central Universities (CUs). Total papers contributed are 7278 papers that received 38456 citations with ACPP 5.77, the MC is achieved by JNU i.e. 954 citations followed by UoA 482 citations and BHU 318 citations. JNU, DU, and AMU contributed the highest with 2064, 1846, and 549 papers respectively. The share of citations these three universities received are 25.18% (9684 citations), 21.81% (8388 citations), and 12.36% (4755 citations) respectively. A total of 104 papers from all the CUs received 50 or more citations each. The highest h index is obtained by JNU (38) followed by DU (36) and AMU (31). The g index is highest for JNU with 65 followed by AMU 48 and 39 for both BHU and UoA. The p index of JNU, AMU, and DU are 35.68, 34.53, and 33.64 respectively. This shows that JNU, DU, and AMU are consistently performing well in all the categories of indicators and it reflects the qualitative impact of the publications. The mean h index for all the universities is 21, the mean g index is 34, and the mean p index is 22.47. Six universities have h index more than

the average value, 8 universities have their g index value more than the average and 7 universities have achieved p-index higher than the average value.

5.4 Citation Impact of Publications by Access type

Table -5 analyzes the total publications and their corresponding citations on the basis of access types. Out of the total papers, 4504 papers (61.89%) are cited and 2774(38.11%) are not cited. The numbers of papers published in the open-access platform are 434 and 6844 papers are from other scholarly publications. The total papers cited in open access type are 312(71.89%) and for closed access, it is 4192 (61.25%). This shows that the scope of getting cited on an open-access paper is higher than the pay for access papers.

Table 5: Citation Impact of Publications by Access type

University	Total Papers (N=7278)			Open Access Papers(N=434)			Closed Access Papers (N=6844)		
	Cited	NC	Total	Cited	NC	Total	Cited	NC	Total
AMU	410	139	549	25	12	37	385	127	512
AU	80	43	123	5	3	8	75	40	115
BHU	258	146	404	39	13	52	219	133	352
DU	1100	746	1846	76	28	104	1024	718	1742
IGNOU	123	102	225	14	6	20	109	96	205
JMI	295	173	468	11	6	17	284	167	451
JNU	1218	846	2064	56	23	79	1162	823	1985
NEHU	98	81	179	7	5	12	91	76	167
PU	191	61	252	29	4	33	162	57	219
SAU	73	63	136	3	4	7	70	59	129
TEZU	85	42	127	5	4	9	80	38	118
UoA	131	49	180	10	2	12	121	47	168
UoH	338	204	542	25	9	34	313	195	508
VBU	104	79	183	7	3	10	97	76	173
Total	**4504 (61.89%)**	**2774 (38.11%)**	**7278 (100%)**	**312 (71.89%)**	**122 (28.11%)**	**434 (100%)**	**4192 (61.25%)**	**2652 (38.75%)**	**6844 (100%)**

5.5 RGR and DT of Publications

Table 6 depicts the RGR and DT of social sciences publications. The RGR observes a decreasing trend from 0.775 in 2010 to 0.157 and the growth rate remains the same for the years 2016 and

2017. DT has increased from 0.895 in 2010 to 4.414 in 2018 except for years 2016 and 2017 when DT was stable. The mean RGR is 0.314 and the mean DT is 2.751.

Table 6: RGR & DT of Publications

Year	Total Publications	Cumulative Publications	W1	W2	RGR	DT
2009	430	430		6.064		
2010	504	934	6.064	6.839	0.775	0.895
2011	497	1431	6.839	7.266	0.427	1.623
2012	655	2086	7.266	7.643	0.377	1.838
2013	615	2701	7.643	7.901	0.258	2.686
2014	680	3381	7.901	8.126	0.225	3.08
2015	772	4153	8.126	8.332	0.206	3.364
2016	936	5089	8.332	8.534	0.202	3.431
2017	1134	6223	8.534	8.736	0.202	3.431
2018	1055	7278	8.736	8.893	0.157	4.414
Total	**7278**				**Mean 0.314**	**Mean 2.751**

5.6 Authorship Pattern

Table 7: Authorship Pattern

University	SAP	MAP	MgAP	>10 authors Paper	TP	Total authorship	DC	CI	CC	MCC
AMU	88	399	59	3	549	1775	0.839	3.233	0.573	0.573
AU	50	68	5	0	123	283	0.593	2.301	0.397	0.398
BHU	102	271	29	2	404	1100	0.748	2.723	0.503	0.503
DU	915	885	42	4	1846	3649	0.504	1.977	0.317	0.317
IGNOU	91	130	4	0	225	437	0.596	1.942	0.357	0.358
JMI	176	242	48	2	468	1237	0.624	2.643	0.429	0.429
JNU	1359	659	42	4	2064	3439	0.342	1.666	0.216	0.216
NEHU	81	92	6	0	179	345	0.547	1.927	0.334	0.335
PU	39	194	17	2	252	706	0.845	2.802	0.546	0.547
SAU	85	50	1	0	136	216	0.375	1.588	0.226	0.227
TEZU	37	79	11	0	127	344	0.709	2.709	0.479	0.481
UoA	43	120	15	2	180	513	0.761	2.85	0.513	0.514
UoH	283	249	10	0	542	1014	0.478	1.871	0.301	0.301
VBU	89	87	5	2	183	375	0.514	2.049	0.317	0.318
Total	**3438**	**3525**	**294**	**21**	**7278**	**15433**	**Mean 0.605**	**Mean 2.306**	**Mean 0.393**	**Mean 0.394**

SAP=single authored papers, MAP-multiple authored papers(2 to 5 authors), MgAP-Mega authored papers (6 to 10 authors)

It is observed from Table -7 that the number of multiple-authored papers (2 to 5 authors) is 3525 which is slightly higher than the single author papers (3438). The mean DC, CI, CC, and MCC are derived as 0.605, 2.306, 0.393, and 0.394 respectively. The DC is highest for PU (0.845) followed by AMU 0.839 and UoA 0.761. The DC is the lowest 0.342 for JNU which means that the single authorship pattern is predominant in JNU. The mean CI for all the universities found to be is 2.306. The CI for six universities are higher than the average CI. The CC for AMU, PU, and UoA are 0.573, 0.546, and 0.513 respectively. MCC is highest 0.573 for AMU and lowest 0.216 for JNU.

5.7 Most Productive Journals

Table-8 represents the top ten most productive journals in the field of Social Sciences. *Economic and Political Weekly* (Economics & Econometrics is covered as one subject area), *International Journal of Biological Macromolecules, Advanced Science Letters* (Social Sciences: Education is covered as one subject area), *DESIDOC Journal of Library and Information Technology* and *Library Philosophy and Practice* are the most prolific journals in the fields of Social Sciences.

Table 8: Top Ten Journals

Sl. No.	Journal Name	No. of Papers
1	Economic and Political Weekly	828
2	International Journal of Biological Macromolecules	387
3	Advanced Science Letters	126
4	DESIDOC Journal of Library and Information Technology	74
5	Library Philosophy and Practice	58
6	Eastern Anthropologist	55
7	Man in India	53
8	Journal of Fluorescence	49
9	Indian Journal of Labour Economics	48
10	Transactions of the Institute of Indian Geographers	47

5.8 Most Prolific Authors

Among the top ten most influential authors, 3 authors are from JNU, 3 are from JMI, 2 authors from Delhi University, and 1 each from AMU and University of Hyderabad. R. H. Khan is the

most prolific author with 42 papers and h index of 18. C.P. Chandrasekhar has contributed 39 papers with h index 5 and J. Ghosh has 38 publications with h index 8. F. Ahmad (28 papers) and M.I. Hassan (26 papers) of JMI have achieved h index 13.

Table 9: Top Ten Most Prolific Authors

Sl. No.	Name of the Authors	University	No. of Contribution	h index
1	R. H. Khan	Aligarh Muslim University	42	18
2	C. P. Chandrasekhar	Jawaharlal NehruUniversity	39	5
3	J. Ghosh	Jawaharlal Nehru University	38	8
4	P. K. Nayar	University of Hyderabad	36	6
5	P. Patnaik	Jawaharlal NehruUniversity	32	6
6	F. Ahmad	Jamia Milia Islamia	28	13
7	M.I. Hassan	Jamia Milia Islamia	26	13
8	A. Mitra	Delhi University	26	9
9	S. Sehgal	Delhi University	26	9
10	A. Islam	Jamia Milia Islamia	23	12

5.9 Network of Collaborative Countries

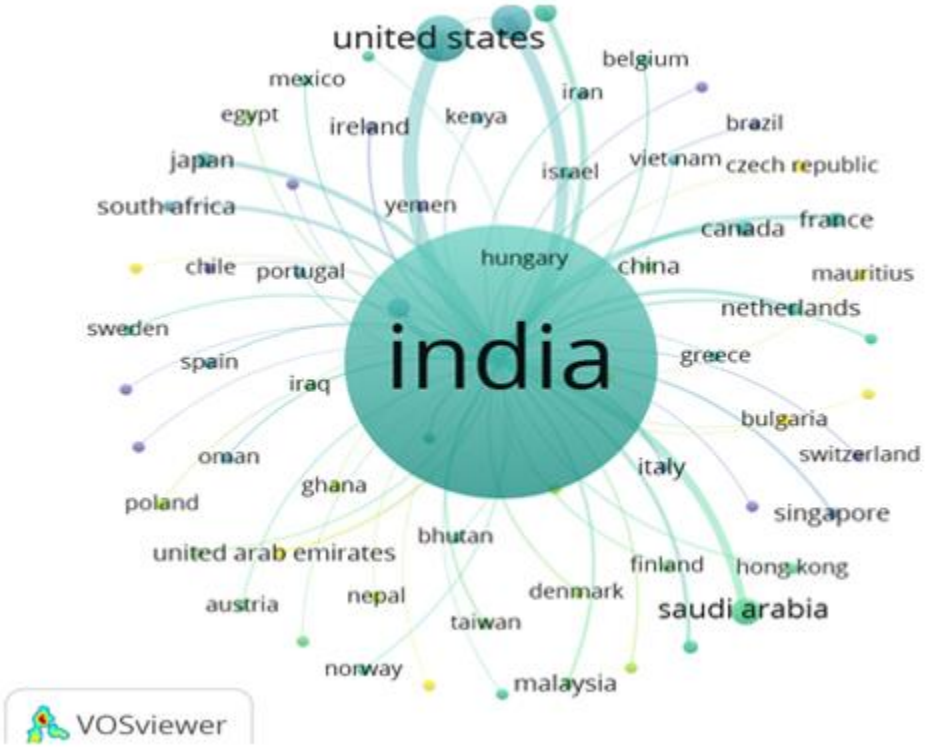

Figure 2: Country Network (Items-67, Cluster-65, Link-67, Total Link Strength-681)

Figure-2 shows the networking of collaborative countries in Social Science research. Excluding India (as the host collaborating country), there are some fairly big circles in the figure, and others are smaller. The relatively little big circles reflect the countries that have collaborated with India more than the others. The total numbers of collaborative countries are 67. The USA contributed 183 papers with 1607 citations; total link strength (TLS) was 169 followed by UK (109 papers, 1212 citations) and TLS (108) and South Arabia (59 papers, 755 citations, TLS 59).

5.10 Mapping of Keywords

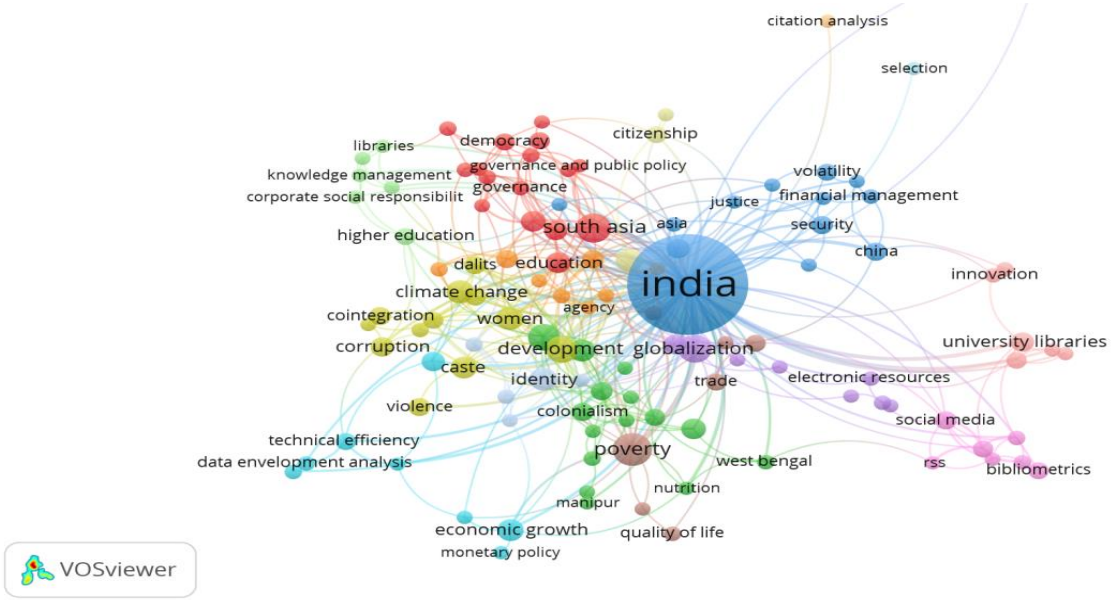

Figure 3: Mapping of Keywords (Items-355, Clusters-16, Links-1778, TLS-2420)

The total numbers of keywords appended are 12710 for the mapping purpose. For mapping of keywords, the minimum frequency taken was 5. The most commonly used keyword is found to be **India** (437, TLS-578) which has come out as the dominant circle in the middle. The next keywords are **Development** (37, TLS-76), and **Gender** (44, TLS-72) which are relatively little big circles than other keywords.

6. Findings and Conclusion:

The research output of the central universities in Social Sciences was analyzed and the impact of these publications was assessed applying various quantitative and qualitative indicators. Vosviewer visualization tool was used to study the country network and keyword network. On

the basis of analysis, articles are the most preferred document type contributing 4293 papers (58.99%) followed by 1612 book chapters with 22.15% share. The total contribution made by JNU is highest (2064 papers, 9684 citations, 28.36%) followed by DU (1846 papers, 8388 citations, 25.36%) and AMU (549 papers, 4755 citations, 7.54%). The mean citation received by JNU was the highest which is 954. JNU, DU, and AMU ranked at the top three positions in receiving the highest number of HCP. HCP for these universities are 26, 21, and 16, h index are 38, 36, and 31, and the g index is found to be 65, 54, and 48 respectively. Regarding p-index JNU has the highest value 35.68 followed by AMU 34.53 and DU 33.64. The ACPP was highest for UoA (11.41), TEZU (11.08), and AMU (8.66). Out of the total publications, 4504 papers were cited, the share of open access papers citation was 71.9% while for the pay for access it was 61.3%. The mean RGR and DT of publications are 0.314 and 2.751. Mean DC, CI, CC, and MCC for these central universities are found to be 0.605, 2.306, 0.393, and 0.394. *Economic and Political Weekly* is the most prolific journal. R.H. Khan of AMU is the most productive author with 42 papers. The most collaborative countries that have collaborated with India are found to be the USA, UK, and South Arabia. This paper provides the relative standing of the prominent Central Universities of Indian context along with valuable insights into the Indian Social Sciences Research. The study also signposts the ample scope of collaboration with the other countries as well as institutions in the field of Social Sciences.

References:

1. Baskaran, C. (2013). Research productivity of Alagappa University during 1999-2011: A bibliometric study. *DESIDOC Journal of Library and Information Technology*, 33(3), 236–242. https://doi.org/10.14429/djlit.33.3.4609
2. Kumar, H. A., Dora, M., and Desai, A. (2015). A Bibliometric profile of Gujarat University, Ahmadabad during 2004-2013. *DESIDOC Journal of Library and Information Technology*, 35(1), 9–16. https://doi.org/10.14429/djlit.35.1.7699.
3. Mohanty, B. (2014). Management Information Systems Quarterly (MISQ): A Bibliometric Study, *Library Philosophy and Practice* (e-journal), 1119. http://digitalcommons.unl.edu/libphilprac/1119.
4. Nagarkar, S., Veer, C., and Kumbhar, R. (2015). Bibliometric analysis of papers published by faculty of life science departments of Savitribai Phule Pune University during 1999-2013.

DESIDOC Journal of Library and Information Technology, 35(5), 368–375. https://doi.org/10.14429/djlit.35.5.8429.

5. National Institutional Ranking Framework at https://www.nirfindia.org/Parameter (accessed on 01.12.2020).
6. Prathap, G. (2010). The 100 most prolific economists using the p–index. *Scientometrics*, 84, 167–172. https://doi.org/10.1007/s11192-009-0068-0.
7. Sahoo, J., Mohanty, B., and Sahoo, L. P. (2017). Indian Contribution To Open Access Scholarly Publishing in DOAJ. (2017). *Library Philosophy and Practice (e-journal)*, 1567. http://digitalcommons.unl.edu/libphilprac/1567.
8. Savanur, K., and Konnur, P. V. (2012). Growth and Impact of Research Output of Bangalore University, 1971-2010: A Scientometric Study. *International Journal of Library and Information Science*, 4(5), 71–80. https://doi.org/10.5897/IJLIS11.080.
9. Singh, J. K. (2013). Contribution of Scholarly Research Output in Physics: A Study with Special Reference to the Banaras Hindu University. *International Journal of Information Dissemination and Technology*, 3(1), 15-21.
10. Siwach, A. K., and Kumar, S. (2015). Bibliometric analysis of research publications of Maharshi Dayanand University (Rohtak) during 2000-2013. *DESIDOC Journal of Library and Information Technology*, 35(1), 17–24. https://doi.org/10.14429/djlit.35.1.7789.
11. Reddy, K. S., Xie, E., and Tang, Q. (2016). Pacific Science Review B : Humanities and Social Sciences rankings : A case of India and comparison with China. *Pacific Science Review A: Natural Science and Engineering*, 2(1), 1–21. https://doi.org/10.1016/j.psrb.2016.09.004.
12. Rienda, L., *et al.* (2014). Doing business in India : a review of research in leading international journals", *Journal of Indian Business Research*, 3(3), 192–216. https://doi.org/10.1108/4191111157056.