A Bibliometric Study on Social Science Research in Sri Lanka for Fifteen Years (2003-2017)

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ABSTRACT: *Research performance in Sri Lanka has increased appreciably during the past few years, both in regard to relative output of publications and in their impact on the international research productivity. The purpose of this survey, based on the data recorded in the Social Science Citation Index (SSCI) database between 2003 to 2017, is to study the research performance in the Sri Lanka. The 1260 papers published in domestic or foreign periodicals were selected for analysis and evaluation of the distribution of publications and citations, for the numerical characterization of research performance in Sri Lanka.*

Keywords: Bibliometric Study, Social Science, Sri Lanka

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1. Introduction

The term "Bibliometrics" was first coined by Pritchard in 1969 and its usage and practice can be traced back to the second decade of this country. A pioneer example of a bibliometric study was a 'statistical analysis of the literature' of comparative anatomy from 1543 to 1860 by counting the number of titles, both books and journal articles, and grouping them by countries of origin within periods. ln 1923 the second study was conducted by Hulme, entitled "statistical Analysis of the history of Science". His analysis was based on the original entries in the seventeen sections of the "English International Catalogue of Scientific Literature". The third study was the pioneering work of Gross and Gross reported in 1927. They used the method of counting and analyzing the citations appended 10 articles in the Journal of the American Chemical Society, and produced a list of journals of 'importance in chemical education'. The fourth and prominent work was of Broadford in 1934 on the distribution and in Lubrication research.

The word 'bibliornetric' has been derived from the Latin and Greek words 'biblio' and 'metrics' which refer to the application of mathematics to the study of bibliography Periodicals are the primary source of information and an important media for communication. They play a major role for communicating the latest research findings and publishing the articles containing the current

development in any field of knowledge. They are forceful reflectors of emerging new trends in any discipline. Information is one of the most important resources for a nation and forms the integral base for the economic, cultural and scientific development of the country as a whole and periodicals are the main carriers of nascent thought and information.

2. Objective

The main objective of this study is to analyze the research performance of Sri Lanka in Social Science in the national and global context, as reflected in the publication's output during 2003-2017. In particular, the study focused on:

1. Sri Lankan research out, its Exponential growth rate, and global publications' share and impact.
2. The Patterns of International and major collaborative partners.
3. The Publications' productivity and impact of leading institutions of Sri Lanka
4. The characteristics of the most prolific authors and high-cited papers
5. The patterns of research communication in the most productivity journals.

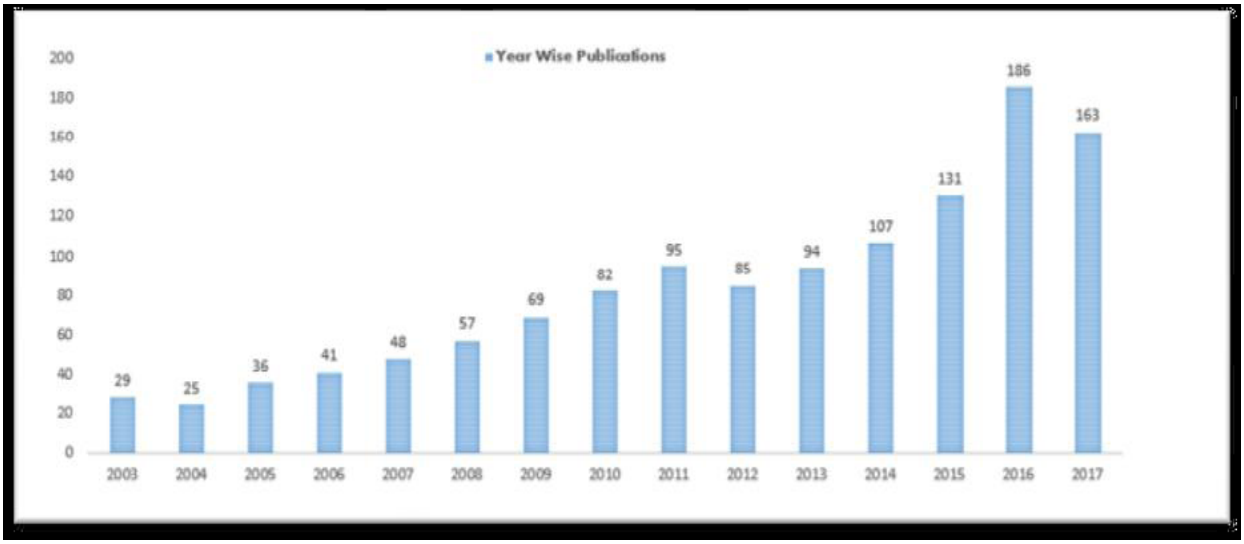
Data was collected from the Social Science Citation Index (SSCI) which is available via the Web of Science (WoS). The WoS is the search platform provided by Thomson Reuters (the former Thomson Scientific emerged from the Institute for Scientific Information (ISI) in Philadelphia). SSCI database is one of the very comprehensive databases covering all aspects of Social Science. The study period is selected from (2003-2017). A total of 1260 records were downloaded and analyzed by using the **Histcite** software application as per the objectives of the study.

3. Analysis and Discussions

S.No	Publication Year	Records	Percentage	TLCS	TGCS
1	2003	29	14.841	38	797
2	2004	25	12.937	13	470
3	2005	36	10.476	31	827
4	2006	41	8.81	44	767
5	2007	48	7.54	44	1192
6	2008	57	7.46	38	1114
7	2009	69	6.746	35	875
8	2010	82	6.508	43	1038
9	2011	95	5.476	52	969
10	2012	85	4.524	52	9327
11	2013	94	3.81	20	1011
12	2014	107	3.254	17	1681
13	2015	131	2.857	39	4288
14	2016	186	2.778	27	1020
15	2017	163	1.984	4	182
	Total	1260	100	497	25558

Table 1. Year wise research Output

TLCS- Total Local Citation Score, TGCS-Total Global Citation Score



The Table 1 was given year wise growth and collaboration rate in Social Science in Srilanka. During 2003-2017 a total of 1260 publications were published in Social Science in Srilanka. The average Number of Publications produced per year was 84%. The highest number of publications 186 was produced in 2016. The lowest number of publication 25 was produced in 2004.

S.No	Publication Year	Records	Exponential Growth Rate
1	2003	29	-
2	2004	25	0.16
3	2005	36	1.17
4	2006	41	1.12
5	2007	48	1.13
6	2008	57	1.17
7	2009	69	1.67
8	2010	82	1.71
9	2011	95	1.72
10	2012	85	1.71
11	2013	94	1.65
12	2014	107	1.71
13	2015	131	2.17
14	2016	186	3.35
15	2017	163	1.17
	Total	1260	21.61

Table 2. The Exponential growth rate of publications

The Table 2 reveals that the Exponential growth rate of publications in Social Science in Sri Lanka research output. An exponential growth in number of publication was observed during 2003-2017, average growth rate is 1.10. The highest growth rate is 3.35 found during 2016. It was found very low growth rate (0.16) at the year of 2004 with 25 publications. The total exponential growth rate value is 21.61.

	2003	**2004**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**Total**	**%**
Single author	10	13	8	7	16	12	14	14	19	11	16	10	17	18	13	198	16
Double authors	15	19	20	24	16	15	16	19	19	28	30	34	13	23	23	319	25
Triple authors	6	5	7	11	12	10	13	11	21	23	22	26	25	15	17	222	18
Four authors	6	10	8	13	6	8	15	11	12	5	10	12	6	11	8	143	11
Five authors	5	6	5	8	5	4	9	7	10	6	6	8	7	6	5	97	8
Six authors	4	5	3	3	5	6	5	5	4	9	7	9	6	6	7	84	7
Seven authors	3	5	6	2	4	3	2	2	2	4	9	10	8	4	9	67	5
Eight authors	-	-	1	3	4	2	1	1	2	-	-	1	6	1	2	24	2
Nine authors	1	2	-	-	-	-	-	-	-	1	1	3	1	-	5	14	1
Ten authors	2	1	2	1	1	5	2	2	1	7	4	6	1	3	6	44	3
>ten authors	1	1	3	4	3	3	5	2	2	4	5	4	4	3	4	48	4
Total	53	67	63	76	72	68	82	74	92	98	110	123	94	90	99	1260	100

Table 3. Degree of collaboration among authors

It is found from the study that collaborative research is ensured between the authors Social Science in Sri Lanka research output as 16% of publications made by single authors. More than 80% of the research papers are published by 2 to 3 authors. It is also found that the papers published by more than 10 authors.

Year	Single Authors		Multi Authored		Total	Collaboration Coefficient
	No of Output	0/0	No of Output	0/0		
2003	10	5.1	43	4.0	29	0.5
2004	13	6.6	54	5.1	25	0.5
2005	8	4.0	55	5.2	36	0.75
2006	7	3.5	69	6.5	41	0.78
2007	16	8.1	56	5.3	48	0.69
2008	12	6.1	56	5.3	57	0.72
2009	14	7.1	68	6.4	69	0.66
2010	14	7.1	60	5.6	82	0.63
2011	19	9.6	73	6.9	95	0.75
2012	11	5.6	87	8.2	85	0.84
2013	16	8.1	94	8.9	94	0.78
2014	10	5.1	113	10.6	107	0.81
2015	17	8.6	77	7.3	131	0.87
2016	18	9.1	72	6.8	186	0.82
2017	13	6.6	86	8.1	163	0.94
Total	198	100	1062	100	1260	(10.1) 0.72

Table 4. Single Vs multi-author and collaboration Coefficient of Social Science in Srilanka research output

A study of the above data indicates the collaboration coefficient in the research output on Social Science in Srilanka. The collaboration coefficient is 0.72 during the study period 2003-20172. i.e., out of the total 1260 literature published, 84 percentages of them are published under joint venture. During the year 2008 to 2012 the collaboration coefficient was of a constant value of 0.84 and 0.82. It is seen clearly from the above that the collaboration coefficient in producing research output on Social Science in Srilanka research has shown an increasing trend during the study period since it is a new discipline. Based on this study, the result of the collaboration coefficient $C = 0.72$. i.e, 72 percent of collaborative author's articles published during the study periods.

No	Author	Records	TLCS	TGCS
1	Sumathipala A	46	58	501
2	Dharmaratne SD	28	58	14295
3	Siribaddana S	27	26	223
4	Wickramasinghe V	26	12	137

5	Hanwella R	20	6	136
6	De Silva V	17	7	94
7	Jayasinghe S	16	5	68
8	Siriwardhana C	16	5	81
9	Rajapakse S	15	1	126
10	Siribaddana SH	14	30	151

Table 5. Top 10 most productive authors with respect to the number of article dealing with Social Science

The most productive author is Sumathipala A (Senior Lecturer, Hon. Director, Institute for Research and Development in Sri Lanka) with 46 papers dealing with social science and 8.04% of all papers published in this research field. The authors of the seminal publication on social science given Table 5, Dharmaratne SD, Siribaddana S and Wickramasinghe V(National Hospital, Honorary Consultant Psychiatrist to National Hospital of Sri Lanka, Colombo), appear on rank 2 (28 papers) , 3(27 papers), and forth (26 papers) respectively.

No.	Journal	Records	TLCS	TGCS
1	ASIA-PACIFIC JOURNAL OF PUBLIC HEALTH	33	16	150
2	LANCET	30	63	15346
3	INJURY PREVENTION	28	16	151
4	BRITISH JOURNAL OF PSYCHIATRY	23	42	352
5	BMC PUBLIC HEALTH	22	0	116
6	BMC MEDICAL EDUCATION	16	0	99
7	BMC PSYCHIATRY	14	0	169
8	WORK-A JOURNAL OF PREVENTION ASSESSMENT & REHABILITATION	13	1	16
9	JOURNAL OF EPIDEMIOLOGY AND COMMUNITY HEALTH	11	2	5
10	PLOS ONE	11	0	127

Table 6. Top 10 Most Productive Journals

4. Scattering of Articles

The articles of social science which appears in various journals have been ranked and the top 10 journals are displayed in the above table. The results are self explanatory by stating that Asia-Pacific Journal of Public Health in rank- I followed by the other journals.

The following table 7 shows the frequency of words occurred in the articles cited. The word "Sri" with the highest of 575 records 261 Total Local Citation Score and 3167 total Global Citation Score followed by "Lanka" and "Health" appear on rank 2 (492

papers) and 3(129papers), respectively.

No	Word	Recs	TLCS	TGCS
1	SRI	575	261	3167
2	LANKA	492	243	2889
3	HEALTH	129	46	1578
4	LANKAN	78	17	275
5	CASE	63	14	342
6	ANALYSIS	62	50	14082
7	MANAGEMENT	62	16	456
8	CARE	57	21	806
9	DEVELOPMENT	56	11	469
10	WATER	53	21	886
11	USE	52	16	393
12	BASED	49	28	328
13	WOMEN	49	12	294
14	MENTAL	48	42	995
15	CHILDREN	46	15	387
16	IMPACT	46	34	487
17	CROSS	45	13	291
18	DISEASE	45	52	13878
19	FACTORS	45	11	215
20	COUNTRIES	43	57	3573

Table 7. Word wise distribution of Documents

No	Institution	Recs	TLCS	TGCS
1	Univ Colombo	289	159	2901
2	Univ Peradeniya	183	100	15940
3	Univ Kelaniya	96	24	361
4	Int Water Management Inst	81	29	1718
5	MinistHlth	68	44	8563
6	Univ Moratuwa	66	22	338
7	Univ Sri Jayewardenepura	64	26	441
8	Univ Ruhuna	56	26	439

9	RajarataUniv Sri Lanka	36	5	115
10	Univ Jaffna	22	7	467

Table 8. Top 10 most Productive Institutions

In this study the literature on social science, a promising new material, has been analyzed by bibliometrics methods. The time evolution of the overall number of citations reveals that the impact increase of the social science papers is possibly going to outrun the impact increase of the related research fields on social science.

Table 8 indicates Institution-wise research productivity. It is noted that University of Colombo ranks first in order by contributing 289 of total research output. The second place in order is recorded by University of peradeniya, which shares 183, University of Kelaniya 96, respectively.

The Extent of International collaboration as seen from co-authored is presented in Table 9. Srilankan researchers has collaborated often with Australia (279) ,United Kingdom (260), USA (206) Canada (79), India (77) Japan (76) Netherland (69) China (60) Sweden (58) and Germany (53). The other Countries have given less than 50 Publications in Collaboratively.

No.	Country	Recs	TLCS	TGCS
1	Australia	279	169	17109
2	UK	260	242	17970
3	USA	206	124	17284
4	Canada	79	66	15277
5	India	77	83	15508
6	Japan	76	66	14987
7	Netherlands	69	66	15117
8	Peoples R China	60	63	15163
9	Sweden	58	69	14891
10	Germany	53	50	10683

Table 9. Top 10 Collaborative Countries

5. Summary and Conclusion

The present paper studied the pattern of growth of Social Science research output, is distribution in different sub-field, output of different agencies, communication institutions, studied their activity profile and the impact of their research output as seen through citations, and identified prolific authors and highly cited papers. The average Number of Publications produced per year was 84. The highest number of publications 186 was produced in 2016. The most productive author is Sumathipala A with 46 papers dealing with social science papers published in this research field. The results are self explanatory by stating that Asia-Pacific Journal of Public Health in rank- I followed by the other journals. There is an urgent need for substantial increase in research and development investments, both at the institutional level as well as in terms of extramural funding from different Social Science agencies. Academic institutes should take steps to create interest in research in Social Science among graduate and postgraduate students and also among young Social scientists. Such efforts should include specialized training programs with support from funding agencies. There should be a substantial increase in international collaboration to increase the output and also to improve the quality of research. In addition there should be more collaboration among the Sri Lankan institutions.

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