

**Scholarly Research Trend of Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Nauni During the Year 2006-2015: A Bibliometric Analysis**

**Lambodara Parabhoi**

Professional Assistant  
Indian Institute of Advanced Study,  
Rashtrapati Nivas, Shimla  
Email:suresh19871987@gmail.com

**Ramani Ranjan Sahu**

Assistant Librarian  
Indian Institute of Public Health, Gandhinagar  
Email: sahu.ramaniranjan0@gmail.com

**Neetu Kumari**

Semi Professional Assistant  
Indian Institute of Technology (Indian School of Mines),  
Dhanbad  
Email: neetusinghlibrariandav@gmail.com

**Abstract** - *The present study based on bibliometric analysis of research publication of Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan from 2006-2015 indexed in Scopus database. A total number of 560 documents were published during the ten years from 2006 to 2015. All publications have been examined carefully to explore the data that is types of publications, year wise publications of Articles, Authorship patterns, collaborations, average number of citation per article, preferable journals, subject wise distributions, author productivity etc. Journals are the primary source of references used for writing research papers. The data shows that 88.21 % are published articles. The main research area was Agricultural and biological Science. The most preferred journal for publication was Indian Journal of Agricultural Sciences and the most prolific author was "Sharma, N.". Sharma N. also got first rank with received of H-index 8, G-index 10 and M-index 0.6666667. The highly cited paper found in this study was "Synthesis of ZnO nano particles and study of their antibacterial and antifungal properties".*

**Keywords:** Scholarly Research Trend, Bibliometrics study, Research output, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Scopus

## **1. Introduction**

The term bibliometrics invented by Alan Pritchard in the year 1969. The term bibliometrics is repeatedly used in library and information science. It is a process to counting of research publications which are already published. Bibliometric analysis is the quantitative description of literature and helps in the measurement of the patterns of all forms of recorded information and their producers (Kuri and Palled, 2016). Research is a continuous process. Every year large number of research papers has been published in different forms and formats that may be print, digital form and other. The University plays a vital role to generate new knowledge. To analyze the research output of any organizations, institutions there are different tools has been used. The Secondary tools like Scopus, Web of science, Google scholar etc, are used to

analyze the research output of any organizations, Institutions, etc. The present study based on secondary data retrieved from Scopus database published papers during the year 2006 to 2015 of Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan.

## **2. About Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan**

Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan is one of the premier research and teaching organization which is situated 14 kms. away from Solan, on the road Solan – Rajgarh, State of Himachal Pradesh. It was set up in year of 1st December, 1985. It is a well known research University in the field of Horticulture and Forestry. Currently the University has 237 number of Faculty. The University currently consists of nine departments namely, Pomology, Fruit Breeding & Genetic Resources; Postharvest Technology; Vegetable Crops. Floriculture and Landscaping; Mycology & Plant Pathology; Entomology & Apiculture; Biotechnology and Business Management. It offers under graduate to Ph.D. programme.

## **3. Related research**

(Singh, 2015) has studied the research output of Delhi University indexed in Web of Science (WoS) during the year 1990 to 2014. He made an attempt to find out the degree of collaboration among author, Collaboration with other institutions, Major area of research at Delhi University authors. A study taken by (Kumar, Dora, & Desai, 2015) on Gujarat University during the ten-year period between 2004 and 2013 using Scopus data. The study reveals that, 83% are journal articles, the most preferred journal of the faculty of Gujarat University was *Acta Poloniae Pharmaceutica-Drug Research*. A study conducted by (Sa, 2015) to explore the research output of Institute of Mineral and Material Technology India. His study mainly focus on most productive journal, the most frequent keywords, preferential subject area, most favoured document type, most productive institutions, most productive country, most favoured source type and most cited authors etc.(Sheeja & Susan, 2014) examine the research productivity of Cochin University of Science and Technology (CUSAT) during 2009 the data collected from Web of Science (ISI). They found that, CUSAT research community prefers foreign journals rather than Indian journals to communicate their research findings.(Goswami & Hazarika, 2014) analyzed the publication trends of Tezpur University (T.U.). They found 847 items Web of Science, based on this data the study reveal that, T.U received a total of 4763 citations during the period of 14 years, average output of the organization was 60 publications per year; the peak was 200 items in 2012 and the minimum was 4 items in the year 1999.. Another study made by (Maharana, 2013) at Orissa University of Agricultural Technology (OUAT), Bhubaneswar. He has analyzed the research output published during the year 2008 to 2012. And he has identified the average of annual publications range from 33 to 34 papers, with 0.96 degree of collaboration. (Kumar and Dora, 2012) analyzed the research productivity of Indian institute of management (IIMA) which is Indexed in Web of Science and Scopus database during the year 1999 to 2010.

## **4. Objectives**

- To identify the type of publication of Dr. Yashwant Singh Parmar University of Horticulture and Forestry from 2006-2015
- To find out the year-wise distribution of paper published during the year 2006-2015

- To ascertain the authorship patterns and prolific authors of University.
- To find out collaborations among other institutions
- To analyzed the most preferable area of research of Dr. Yashwant Singh Parmar University of Horticulture and Forestry
- To find out the top most preferred journals of author
- To discover the top five most cited paper published

## 5. Limitation

The limitation of the study is only concentration on Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan. Secondly we selected literature which is index in Scopus database form 2006-2015. Thirdly the study only concentrates one Scopus database rather than other databases.

## 6. Methodology

The present study base on Scopus secondary data during the year 2006 to 2015. Data retrieved using affiliation search Keyword in Scopus database. It retrieved 560 no of documents it includes journal articles, conference papers, book chapters etc. Data was imported in CSVfile format. And then data analysed using Ms-Excel sheet. The paper has written using different Graphs and tables.

## 7. Data Analysis

### 7.1 Types of Research Publications

The Data of this study has taken form Scopus secondary database. There are different types of research publications found these are articles, conference papers, review papers, book chapters and others. The top percentage of research publication is article with no of 494 (88.21 %) papers so it is found that the authors of the university are more concentrate to published papers as a research article rather book chapters, review papers, conference papers etc. The lowest type of publication is book chapter with 5(0.89%) publications. Out of total 560 publications conference paper is 26 (4.64%), review paper is 15(2.67 %) and others are only 20(3.57 %).

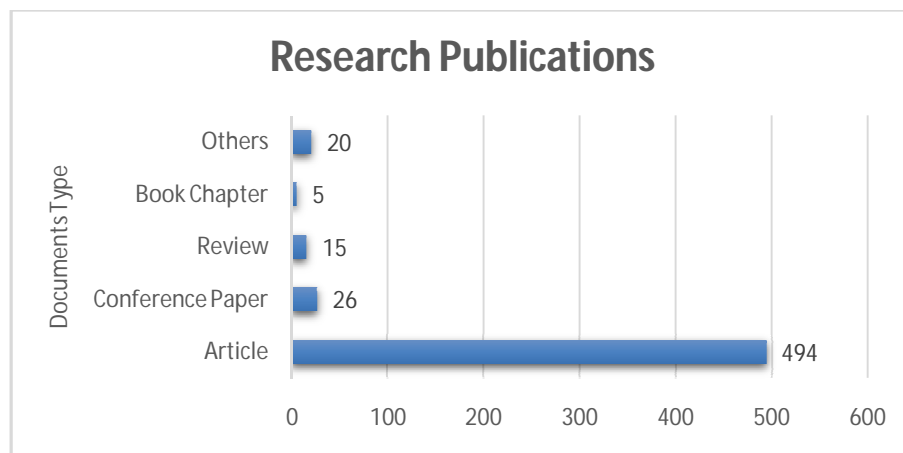


Figure-1

## 7.2 Year Wise Publications Growth

According to data we can see here the lowest growth of publication is in 2007 35 no of publications. There are 560 no of publications found form 2005-2016. In 2014 the most publications of this study is in pick level with 83 publications. The growth of publication is in zigzag motion and from 2010 to 2014. It is continuously increased from 2010 to 2014 and reached 83 publications it was good symbol for research and again in 2015 it decrease slightly and reached 73 publications.

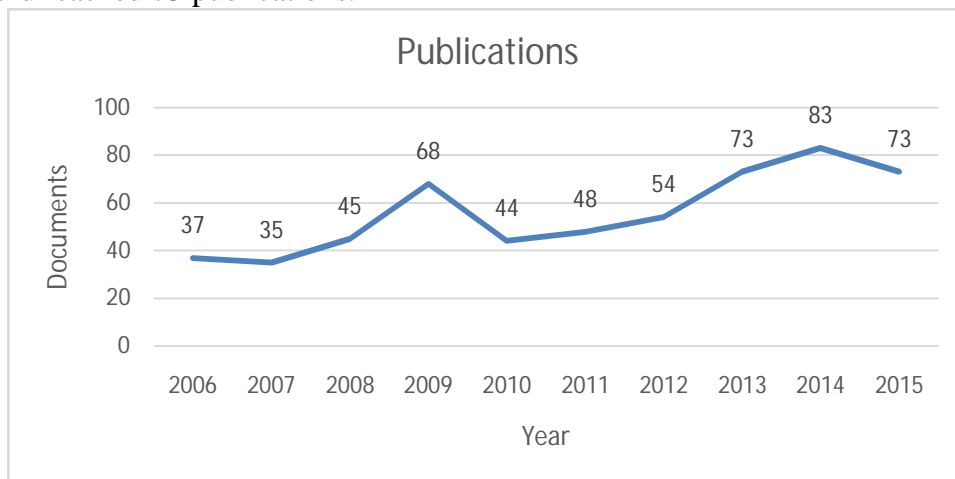


Figure-2

## 7.3 Authorship Pattern

The data highlights the authorship pattern of Dr. Yashwant Singh Parmar University of Horticulture and Forestry, where single authors contributed less no of papers 25 (4.46%) and multi authors published highest no of papers 306(54.64%) from total no of papers 560. Two authors published 139(24.82%) no of papers and Mega authors published 90 (16.07%) no of papers.

Authorship Pattern	No. of Contribution 2006-2015	Percentage
Single Author	25	4.46
Two Authors	139	24.82
Multi Authors	306	54.64
Mega Authors	90	16.07
Total	560	100

Table-1

## 7.4 Co-Authorship Pattern

The data reflect that, Co-authorship pattern there are total no of authors are 1897. The co-authorship pattern indicates that collaborative authorship is more popular and published more papers. The above table-1 show the data were divided into four authorship groups i.e. single, two, multi (3 and 4), mega (5 and above) authors. The table-2 shows that total no number of authors contribute their total no of papers. It also indicates that multi author's paper and mega-author paper were contributed 70 % of Publications. Where single author papers are 4.46 % which proves that most of the research happened through collaboration.

No of Authors	No. of Papers	Total no of Author	% of Paper
One	25	25	4.46
Two	139	278	24.85
Three	198	594	35.35
Four	108	432	19.28
Five	52	260	9.28
Six	19	114	3.39
Seven	8	56	1.42
Eight	1	8	0.17
Nine	1	9	0.17
Ten	1	10	0.17
Eleven	2	22	0.35
Twelve	2	24	0.35
Thirteen	1	13	0.17
Fifteen	2	30	0.35
Twenty-two	1	22	0.17
	560	1897	100

Table-2

### 7.5 Most Prolific Authors

This study shows the most prolific author is Mr. N Sharma with 43 (125) papers whose citations are 125 and ACPP 2.9 and its rank as per ACPP is 6. Similarly least prolific author is Mr. R Kumar with 20 no of papers and whose citations is 57 and its ACPP is 2.85 with rank as per ACPP is 7. Joshi, V.K. contributed 39 no of papers with 143 citations and 3.66 ACCP rank as ACPP is 3 where as Sharma, S. achieved third position with 28 no of papers with 186 citations ACPP is 6.64 ranked as per ACPP is 1. It is also indicated that Kumar, R. 20 no of papers with citations 57 ACCP is 2.85 got ACCP ranked 7.

Rank	Author's Name	No. of Papers	Citations	ACPP	Rank as Per ACPP
1	Sharma, N.	43	125	2.9	6
2	Joshi, V.K.	39	143	3.66	3
3	Sharma, S.	28	186	6.64	1
4	Kumar, P.	27	69	2.55	9
5	Kumar, S.	26	93	3.57	4
6	Sharma, P.C.	25	68	2.72	8
7	Sharma, R.	24	55	2.29	10
8	Chauhan, A.	23	68	2.95	5
9	Sharma, S.D.	21	82	3.9	2
10	Kumar, R.	20	57	2.85	7

\* ACPP --Average Citation Per Paper

Table-3

### 7.6 Top Ten Collaborative Organizations – Contribution of Publication

It is observed from the below table that, Indian Agricultural Research Institute has contributed 15 papers and first position where as Central Potato Research Institute 10 papers and Punjab Agricultural University and Sher-e-Kashmir University of Agricultural Sciences

and Technology contributed 9 papers. Swedish University of Agricultural Sciences achieved 10 place and contributed 2 papers.

SL	Collaborative Organizations	Contribution of Publications
1	Indian Agricultural Research Institute	15
2	Central Potato Research Institute	
3	Punjab Agricultural University	9
4	Sher-e-Kashmir University of Agricultural Sciences and Technology	9
5	National Bureau of Plant Genetic Resources India	8
6	Chaudhary Sarwan Kumar Himachal Pradesh KrishiVishvavidyalaya	7
7	Institute of Himalayan Bioresource Technology, India	6
8	Central Soil and Water Conservation Research & Training Institute	6
9	Shoolini university of biotechnology and management sciences	5
10	Swedish University of Agricultural Sciences	2

Table-4

### 7.7 Most Preferred Journals for Publishing:

The table indicates that, Indian Journal of Agricultural Sciences Impact factor (0.238 in 2015) publisher- Indian Council of Agricultural Research is most preferred journal where 56(10%) no of the titles published during the study year 2006-2015. It is followed by Indian Journal of Horticulture 41 (7.32%) no of articles published from Horticultural Society of India impact factor (0.289 in 2015) and Journal of Food Science and Technology 39 no of articles (6.96%) published from Springer impact factor (0.441 in 2015).

Rank	Name of the Publications	Publisher	No. of Articles	Impact Factor 2015	% of Publications
1	Indian Journal of Agricultural Sciences	Indian Council of Agricultural Research	56	0.238	10
2	Indian Journal of Horticulture	Horticultural Society of India	41	0.289	7.32
3	Journal of Food Science and Technology	Springer	39	0.441	6.96
4	Acta Horticulturae	International Society for Horticultural Science	26	0.171	4.64
5	Indian Journal of Natural Products and Resources	NISCAIR	23	0.234	4.1
6	Annals of Agri Bio Research	Agri Bio Research	17	0.119	3.03
7	Annals of Biology	Agri Bio Research	15	0.146	2.67
8	Advances in Horticultural Science	Firenze University Press	14	0.12	2.5
9	Current Science	Indian Academy of Sciences	13	0.325	2.32
10	National Academy Science Letters	National Academic of Sciences	12	0.203	2.14
11	Journal of Scientific and Industrial Research	NISCAIR	11	0.25	1.96
12	Scientia Horticulturae	Elsevier	11	0.73	1.96
13	Proceedings of the National Academy of Sciences India Section B - Biological Sciences	Springer	10	0.227	1.78
	2 Publications with Nine Papers each		18		3.21
	3 Publications with Eight Papers		24		4.28

	each				
	3 Publications with five Papers each		15		2.67
	5 Publications with four Papers each		20		3.57
	16 Publications with Three Papers each		48		8.57
	27 Publications have Two Papers each		54		9.64
	93 publications have one paper each		93		16.6
			560		100

Table-5

### 7.8 Top highly cited papers

From table- 8 highly cited papers found that the article entitled “Synthesis of ZnO nanoparticles and study of their antibacterial and antifungal properties” by Sharma D., Rajput J., Kaith B.S., Kaur M., Sharma S got first rank with received no of 65 citations it is followed by Synthesis of ZnO nano particles using surfactant free in-air and microwave method by same author Sharma D., Sharma S., Kaith B.S., Rajput J., Kaur M. cited by 47 times and achieved third position article is Salix: Botany and Global Horticulture by Kuzovkina Y.A., Weih M., Romero M.A., Charles J., Hurst S., McIvor I., Karp A., Trybush S., Labrecque M., Teodorescu T.I., Singh N.B., Smart L.B. and Volk T.A. cited 41 no of times. Characterization of a new bacteriocin produced from a novel isolated strain of *Bacillus lentus* NG121 by Sharma N., Kapoor G., Neopaney B. and Comparison of genetic transformation in *Morus alba* L. via different regeneration systems by Agarwal S., Kanwar K. got ninth position with 22 citations.

Authors	Title	Year	Source title	Cited by	Rank
Sharma D., Rajput J., Kaith B.S., Kaur M., Sharma S.	Synthesis of ZnO nanoparticles and study of their antibacterial and antifungal properties	2010	Thin Solid Films	65	1
Sharma D., Sharma S., Kaith B.S., Rajput J., Kaur M.	Synthesis of ZnO nanoparticles using surfactant free in-air and microwave method	2011	Applied Surface Science	47	2
Kuzovkina Y.A., Weih M., Romero M.A., Charles J., Hurst S., McIvor I., Karp A., Trybush S., Labrecque M., Teodorescu T.I., Singh N.B., Smart L.B., Volk T.A.	Salix: Botany and Global Horticulture	2008	Horticultural Reviews	41	3
Joshi V.K., Parmar M., Rana N.S.	Pectin esterase production from apple pomace in solid-state and submerged fermentations	2006	Food Technology and Biotechnology	33	4
Kumar R., Aggarwal R.K., Sharma J.D.	Energy analysis of a building using artificial neural network: A review	2013	Energy and Buildings	29	5

Kumar A., Sharma G., Naushad M., Singh P., Kalia S.	Polyacrylamide/Ni0.02Zn0.98O nanocomposite with high solar light photocatalytic activity and efficient adsorption capacity for toxic dye removal	2014	Industrial and Engineering Chemistry Research	27	6
Kanwar K., Joseph J., Deepika R.	Comparison of in vitro regeneration pathways in Punicagranatum L.	2010	Plant Cell, Tissue and Organ Culture	25	7
Joshi V.K., Sharma S., Rana N.S.	Production, purification, stability and efficacy of bacteriocin from isolates of natural lactic acid fermentation of vegetables	2006	Food Technology and Biotechnology	25	7
Kanwar J.K., Kumar S.	In vitro propagation of Gerbera - A review	2008	Horticultural Science	23	8
Agarwal S., Kanwar K.	Comparison of genetic transformation in Morus alba L. via different regeneration systems	2007	Plant Cell Reports	22	9
Sharma N., Kapoor G., Neopaney B.	Characterization of a new bacteriocin produced from a novel isolated strain of Bacillus lentus NG121	2006	Antonie van Leeuwenhoek, International Journal of General and Molecular Microbiology	22	9

Table-6

### 7.9 Subject wise Publications

This study belongs to different subjects. From the figure it is indicate theta Agricultural and biological science is highest no publication with 446(79.6 %) publications and the lowest publication is in Pharmacology toxicology and pharmaceutics subject with only 7 (1.3%) papers describes. Biochemistry genetics and molecular biology achieved the second position with 89 (15.9) papers it is followed by Environmental Science57 (10.2%).Whereas Earth and planetary science11(2%) papers form second third 11(2%).

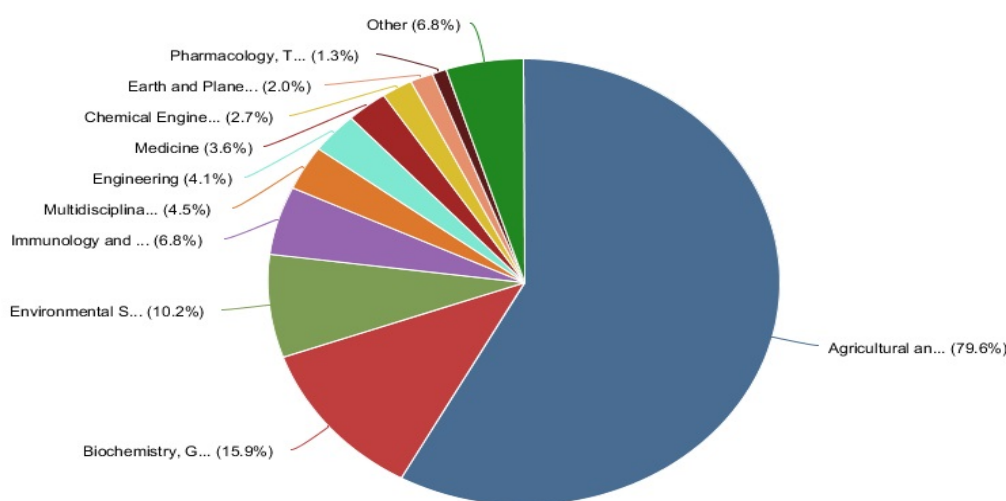


Figure-3



### 7.10 H and G index of top 20 authors

The data reflects the top 20 authors with H-Index, G-Index and M-Index. Sharma N. got first rank with received of H-index 8, G-index 10 and M-index 0.6666667. Joshi V.K. got second position with H-Index 7, G-Index 11 and M-index 0.5833333 whereas Sharma S. got third position with H-Index 5, G-Index 15 and 0.6666667. Singh M. received 20 position with H-Index and G-Index 2 and M-Index 0.1818182.

SL	Author	H-Index	G-Index	M-Index
1	Sharma N.	8	10	0.6666667
2	Joshi V.K.	7	11	0.5833333
3	Sharma S.	5	15	0.6666667
4	Kumar P.	5	6	0.5
5	Kumar S.	4	9	0.4166667
6	Sharma P.C.	5	5	0.3333333
7	Sharma R	5	7	0.4166667
8	Chauhan A.	6	7	0.5555556
9	Sharma S.D.	5	8	0.5
10	Kumar R.	5	8	0.4545455
11	Shirkot C.K.	5	7	0.625
12	Walia A.	5	6	0.8333333
13	Sharma S.K.	3	4	0.25
14	Srivastava D.K.	5	6	0.4166667
15	Mehta P.	5	7	0.625
16	Singh N. B.	3	7	0.2727273
17	Bharwaj S.K.	3	4	0.375
18	Gupta R. K.	2	4	0.1818182
19	Shukla Y.R.	2	3	0.1666667
20	Singh M.	2	2	0.1818182

Table-7

### 8. Finding

The research output of Dr. Yashwant Singh Parmar University of Horticulture and Forestry analyzed data shows some major findings have given below:

- There is imbalance research output of different departments.
- The authorship pattern indicates that increased collaborations with multiple authors.
- The data evaluate the single authors productivity shows the average weight age per paper published by the author.
- The impact factors of the journals are not high.
- Journals are the primary source of references used for writing research papers.
- The H-index of the data shows the average publications and citations of the author's productivity.

### 9. Suggestion

- University should increase the research facilities and also promote research work.
- University should organize some workshop, seminar for improving research activities.
- The University should promote open access movements to increase the citations of the research papers.

## 10. Conclusion

The present study of the analysis of the research performance of Dr. Yashwant Singh Parmar University of Horticulture and Forestry during the year 2006-2015 shows that the overall trend of growth in research publications. The study clearly shows that journals are the most preferred form of publication by the researcher or faculty and publications in Agricultural and biological Science subjects are more in compare to others subjects like social science, applied science, humanities etc. The research collaboration trends indicates that there is 95% publication are multi-authored papers. The collaborations of the research output shows that the university needs some improvements in this publication area. The collaboration will also needs to more publication and citations. The data highlights the strength and weakness of the research output the University. Although the publication strength is gradually improving, but it is not enough to comparison with other Universities. University has to improve their publication strength to position itself as a best universities for research. The universities authorities need to work out to find out the suitable way where they can pursue the faculty and research scholar to enhance their research profile.

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