Asian Journal of Information Science and Technology
ISSN: 2231-6108 (P) Vol.8 No.2, 2018 pp.14-18

DOI: https://doi.org/10.51983/ajist-2018.8.2.187

Waste Water Management by means of Scientometric Study

P. Krishnaveni[1] and J. Selvam[2]
[1]Research scholar, Bharathidasan University, Trichy, Tamil Nadu, India
[2]Librarian and Head, Department of Library & Information Science,
A.V.V.M. Sri Pushpam College, Poondy, Thanjavur, Tamil Nadu, India
E- Mail:pkrishnaveni557@gmail.com
(Received 24 May 2018; Revised 21 June 2018; Accepted 2 July 2018; Available online 16 July 2018)

Abstract **- With a social concern to protect the future generation the topic of "Waste Water Management has been selected. Ten years from 2008 to 2017 are selected and relevant data has been downloaded from Web of Science. Appropriate hypothesis is framed to test the deviation among the publications through the Regression Test and found that the deviation among the data are very low and there is possibility to go for the calculation of doubling time of the records. Percentage analysis of the year wise publications, document wise publications and language wise publications are assessed and tabulated. Top ten country wise publications are tabulated. The Bradford's Law of Scattering is applied to identify the core journals. It is suggested that the ministry of the government to initiate to manage the waste water to protect the lives and resources of the country.**
Keywords: **Waste Water Management, Scientometric, Regression Test, Doubling Time, Bradford's Law of Scattering**

I. INTRODUCTION

"Prevention is better than Cure" is a proverb of eminence and well known by each and every individuals, globally. The proverb is being practically implemented in the day to day life of almost by the majority of the human beings from generation to generation. Prior to the wastage of water, action has to be initiated to save the water from wastage. Excess of any form of organic materials for the human being can be considered as waste. But, a pro-active thought, well defined planning, knowledge of the experienced and outstanding civil engineers and careful implementation of the outcome of the planning committee can help the government to manage the water from being waste. Nowadays, the drainage water is alsobeing recycled and utilized for watering the garden. Appropriate disaster management can well support towards the storage of excess rain water in ponds, lakes and reservoirs. Before the rainy season starts all the storage areas has to be renovated and new storage area has to be erected.As water is one of the prime property of the lives, to assess the response of the global scientists towards "Waste Water Management", this scientomeric study has been conducted.

II. REVIEW OF LITERATURE

The research impact measurement was assessed on "marine". The data related to "marine" was downloaded from Web of Science from the year 2008 to 2017, which reveals that a literature output of 2912 research publications were published. It was found that the number publication from one year to another year inclines. The significant relationship among the publications were tested through Regression Test and proved that there was a significant relationship between the first half of the records and second half.

The doubling time were calculated for the first half of the literature as well as the second half of the literature and the comparative of the both reveals that the second half of the records double in number with less time. Through the research work it was suggested that the ministry of human resource development of global countries to allocate more funds towards enhance more research on "marine" as the major portion of this earth is filled with water.[1]The research study by means of Scientometric analysis was about the literature output on "Pediatric Obesity" from 1997 to 2016. The data was downloaded from Pubmed database. The study reveals that 4366 articles as research output during the stipulated period.

The year 2015 was most prolific with 857 research articles. The journal entitled "Pediatric Obesity" contributed more number of publications with 182(4.17%). The multiple authors played a dominant role over the single author publications with a record count of 3768(86%). The testing of Lotka's law tested and approved to be match worthy of the publications on "Pediatric Obesity".[2] The research reveals very clearly that the author's possession of social concern by means of the selection of topic "Pollution Control". Relevant data were downloaded from Web of Science from 2007 to 2016. The deviation among the research publications published from 2007 to 2011 and from 2012 to 2016 were assessed through the Regression Test and proved that the deviation was quite lesser enough to go for the prediction of future publications. The doubling time were calculated and assessed that the second half of the records double in numbers in 141 days as the first half double in numbers in 252 days. The "English" language publications were higher than the other language publications. As concluding remarks it was suggested to the ministry to enhance more research on "Pollution Control" to protect the living beings of the society.[3] The Scientometric study was about the application of scientometric techniques on the literature output on nanomaterials for ten years from 2003 to 2010. The data has been downloaded from Web of Science database for research work. The research reveals that 16958 numbers of publications were published for the above stated stipulated time. The Total Global Citation

Score and the Total Local Citation Score at the time of research was 208085 and 9969. It was identified that 11 types of publications and 17 different languages were involved towards the publication output. The language "English" played leading role among the language wise publications. Likewise, the multi-authored papers dominated the entire research publications. The core journals were identified Bradford's law. Chi-square test has been applied to test the variation among the year wise publications and proved that the calculated value was lesser than the critical value of 0.05, which proves the possibility of predicting of the future publications. Finally, it was suggested that the global research community should be encourage to do many more research on nanomaterials for the betterment of the society.[4]

III. NEED FOR THE STUDY

Water is an essential element for each and every living being. Therefore water should not be wasted. The role of the social scientists towards the management of the waste water is very badly needed for the society to raise alarm through literature for the storage of water to protect the future generation from water scarcity and drought. Therefore, a scientometric study has been conducted to reveal the contribution of the researchers to enhance the waste water management.

IV. METHODOLOGY

Data for ten years from 2008 to 2017 has been downloaded from Web of Science. The data has been closely assessed to complete the analysis. Appropriate statistical tool has been utilized through Microsoft Excel to test the data and find the results. APA style manual has been utilized for the references cited for the review of literature.

V. DATA ANALYSIS

A. Yearwise Publication of Records

It was identified that a total of 6276 number of publications were published from 2008 to 2017 on "Waste Water Management" and shown in table number I. The year 2017 is credited as most prolific with a record count of 1159(18.5%). The year 2016 is placed in the second place with a record count of 970(15.5%). The year 2015 is placed in the third place with a record count of 874(13.9%). The top three places show that there is a steady pace in the growth of publications in the last three years. The sum of Total Local Citation Score is 4045 and the Total Global Citation Score is 83848. The records published in the year 2009 is cited more with a Total Local Citation Score of 657 and a Global Citation Score of 11505.

TABLE I YEAR WISE PERCENTAGE ANALYSIS OF THE PUBLICATIONS WITH TLGS AND TGCS

Sl. No.	Publication Year	Records	Percentage Analysis	TLCS	TGCS
1	2017	1159	18.5%	49	2050
2	2016	970	15.5%	217	4941
3	2015	874	13.9%	397	8360
4	2014	646	10.3%	337	8682
5	2013	572	9.1%	516	9351
6	2012	497	7.9%	449	9003
7	2011	412	6.5%	408	9184
8	2009	407	6.5%	657	11505
9	2010	405	6.5%	483	11291
10	2008	334	5.3%	532	9481
Total		6276	100%	4045	83848

B. Regression Test

As per the table II, the regression test has been tabulated and found that the P-value of 0.04363 is lesser than the critical value of 0.05. Further, the relationship between the first half of the records and the second half of the records is stated in "R Square" as 0.79, which denotes that the first set of records and second set of records have 79% of relationship. Therefore, the H0 is rejected and the alternate hypothesis is accepted. The H0 and H1 is as follows:

H0: There is no significant relationship between the numbers of publications published from 2008 to 2012 and from 2013 to 2018.
H1: There is a significant relationship between the numbers of publications published from 2008 to 2012 and from 2013 to 2018.

It is proved through the Regression Test that the deviation among the average relationship between the year wise publications are less enough to go for the prediction of doubling time of records.

TABLE II REGRESSION TEST

Regression Statistics				
Multiple R	0.889			
R Square	0.790			
Adjusted R Square	0.721			
Standard Error	126.545			
Observations	5			
X Variable 1	*Coefficients*	*Standard Error*	*t Stat*	*P-value*
	3.67977276	1.094081198	3.36335	0.04363

C. Doubling Time of Records

The table No.III tabulated above shows the calculation of the doubling time of records published on "Waste Water Management". The average of the doubling time of records published from 2008 to 2012 is 1.63. The average of the doubling time of records published from 2012 to 2017 is 1. Further, the average time can be accurately interpreted as that the doubling of records on the basis of the records published from 2008 to 2012 is 12 months and 9 days and for the records published from 2013 to 2017 is exactly 12 months. To show more clarity on the results with accuracy, the months and days are to be taken to reach 4110 records are 12 months and 9 days on the basis of the research output from 2008 to 2012. On the basis of the research output published from 2013 to 2017, the months and days are to be taken to reach 8442 records are only 12 months. It is very clear that the doubling time of records on the basis of the second half will take very lesser time to publish more records. Therefore, the publications of records are in inclining trend.

TABLE III DOUBLING TIME OF RECORDS

Publication Year	Records	Cumulative Records	W1	W2	R(P)	Mean of R(P)	Doubling Time	Average Doubling Time	No. of Months	No. of Days
2008	334	334	2.52	2.52	0.00					
2009	407	741	2.61	2.87	0.26		2.66			
2010	405	1146	2.61	3.06	0.45	0.38	1.53	1.63	12	19
2011	412	1558	2.61	3.19	0.58		1.20			
2012	497	2055	2.70	3.31	0.62		1.12			
2013	572	2627	2.76	3.42	0.66		1.05			
2014	646	3273	2.81	3.51	0.70		0.98			
2015	874	4147	2.94	3.62	0.68	0.70	1.02	1	12	0
2016	970	5117	2.99	3.71	0.72		0.96			
2017	1159	6276	3.06	3.80	0.73		0.94			

D. Language wise Publications

The assessment of the percentage analysis of the language wise publications are tabulated in the above stated table number IV, which reveals that a total of seventeen languages are involved towards the publications of 6276 records.At the outset of the assessment, the language "English" plays predominant role among the global languages towards the publications of literatures on "Waste Water Management" with a record count of 6081(96.89%). The Local Citation Score for the English language publications are 4032 and the Global Citation Scores are 83516 are the highest among the other language publications. All the other languages apart from "English" published only double digit publications. Pfortuguese language placed in the second place with a publication count of 60(0.96%) and from the citation point of view with a credit of only 5nos. of Local Citation Score and 109nos. o Global Citation Score. Spanish language placed in the third place with a publication count of 44(0.70%), for which the publications gained only 1no. number of local citation score and 55nos. of global citation score.

TABLE IV PERCENTAGE ANALYSIS OF LANGUAGE WISE PUBLICATIONS

Sl. No.	Language	Records	Percentage Analysis	TLCS	TGCS
1	English	6081	96.89%	4032	83516
2	Portuguese	60	0.96%	5	109
3	Spanish	44	0.70%	1	55
4	German	20	0.32%	1	21
5	Polish	20	0.32%	3	61
6	French	18	0.29%	2	41
7	Croatian	11	0.18%	0	7
8	Russian	6	0.10%	0	0
9	Italian	5	0.08%	0	2
10	Czech	2	0.03%	0	1
11	Serbo-Croatian	2	0.03%	0	3
12	Turkish	2	0.03%	0	0
13	Arabic	1	0.02%	0	0
14	Chinese	1	0.02%	0	20
15	Japanese	1	0.02%	1	12
16	Korean	1	0.02%	0	0
17	Serbian	1	0.02%	0	0
Total		**6276**	**100%**	**4045**	**83848**

E. Percentage Analysis of the type of Documents Published

The table no. V reveals the percentage analysis of the type of documents involved towards the publications of research papers on "Waste Water Management". It is identified that 12 type of publications are involved in publishing 6276 number of publications on "Waste Water Management". Among those publications, "Articles" published in Journals played dominant role with a count of 5405(86.12%) in comparison with the other type of eleven publications. The articles gained a citation score of 3073 from local and 58484 from the global research scholars. The second place was occupied by "Review", with a record count of 603 numbers of reviews. The reviews gained 754 numbers of Local Citation Score and 21950 numbers of Global Citation Score. The third place has been occupied by the papers published in Conference Proceedings with record count of 213 numbers. The Conference Proceedings received 196 numbers of local citation score and 2741 numbers of Global Citation Score.

TABLE V PERCENTAGE ANALYSIS OF THE TYPE OF DOCUMENTS

Sl. No.	Type of Documents	Records	Percentage Analysis	TLCS	TGCS
1	Article	5405	86.12%	3073	58484
2	Review	603	9.61%	754	21950
3	Article; Proceedings Paper	213	3.39%	196	2741
4	Editorial Material	22	0.35%	6	134
5	Review; Book Chapter	16	0.25%	12	418
6	Article; Book Chapter	5	0.08%	0	12
7	Letter	3	0.05%	0	18
8	News Item	3	0.05%	1	19
9	Correction	2	0.03%	0	32
10	Meeting Abstract	2	0.03%	0	0
11	Article; Retracted Publication	1	0.02%	3	40
12	Review; Early Access	1	0.02%	0	0
Total		6276	100%	4045	83848

F. Top Ten Country wise Publications

The United States of America is in top place with a publication count of 1186 nos, for which the country gained 989 numbers as Local Citation Score and 18966 numbers as Global Citation Score. The second place has been occupied by China with a publication count of 790 numbers, for which the country gained 732 numbers as Local Citation Score and 13176 numbers as Global Citation Score. Spain is placed in the third place with 451 records, for which the country gained 341 number of Local Citation Score and 7624 Global Citation Score. India is placed in the fourth place with a publication count of 393 numbers, for which India gained 214 numbers as Local Citation Score and 5836 numbers as Global Citation Score. The table number VI. indicates a clear information of the ranking of other countries with publication count along with the Local Citation Score and Global Citation Score. In brief, the United Kingdom in 5th place , Canada in the 6th place, Australia in the 7th place, Italy in the 8th place, Germany in the 9th place and France in the 10 place.

TABLE VI RANKING OF TOP 10 COUNTRY WISE PUBLICATIONS

Ranking	Country	Records	TLCS	TGCS
1	USA	1186	989	18966
2	Peoples R China	790	732	13176
3	Spain	451	341	7624
4	India	393	214	5836
5	UK	391	288	7334
6	Canada	381	481	6007
7	Australia	374	352	7681
8	Italy	305	153	4099
9	Germany	273	214	5105
10	France	261	151	4758

G. Application of Bradford's Law

The table VII denotes the segregation of the total number of 1481 journals into three zones to identify the creamy layer journal of 24 which belongs to Zone 1 category to be more productivity than the other journals placed in Zone 2 and Zone 3. Though in number those journals are only 24, but received more Local Citation Score of 2201 and 33968 Global Citation Score in comparing with the other two zone journals.

TABLE VII APPLICATION OF BRADFORD'S LAW

Zone	No. of Journals	No. of Articles	TLGS	TGCS
1	24	2092	2201	33968
2	171	2096	1162	27452
3	1286	2088	682	22428
Total	1481	6276	4045	83848

VI. CONCLUSION

A total number of 6276 records has been downloaded for the research analysis reveals that the publications increases year after year in the inclining trend, because the deviation value is lesser than the critical value. The doubling time proves that the second half the number of publications are more productive than the first half of the number of publications. The language "English" plays vital role by contributing more number of publications. The articles published in journals are in dominant role among the other type of publications. The Bradford's law identifies that among 1481 journals, only 24 are more productive. At the outset, it is very clear that the global scientists are in right direction by contributing more publications year after year to give prominence about "Waste Water Management", but if the ministry of each and every government supports and encourages more research work on the topic, it would of a great help to drive away the drought and water scarcity, so that the contemporary generation can have a good platform for the future generation.

REFERENCES

[1] Prabakar, S., Nagarajan, M., & Thirumagal A. (2018) "Marine" in Web of Science: By Means of Scientometric Analysis. *International Journal of Information Movement*. *2*(11), 188-193.

[2] Janarthanan, P.I., Prabakar, S., Nagarajan, M., & Nithyanandam, K.(2018) Scientometric Study of Literature on Obesity in Children from the year 1997 to 2016. *IALA – Journal. 6*(1&2), 205-209.

[3] Prabakar, S., Nagarajan, M., & Vivekanandan, S. (2017). Scientometric Analysis on Pollution Control. *E-Library Science Research Journal*. *5*(12), 1-6.

[4] Prabakar, S., & Thirumagal, A. (2013). Nanomaterials: A Scientometric Analysis. *Asian Journal of Information Science & Technology (AJIST)*. *3*(2).