### **DECLARATION**

I Mrs. Sehnara Begum Choudhury hereby declare that, this thesis entitled "Bibliometric Analysis of Doctoral Theses in Life Sciences Submitted to Assam University during 1996 to 2012" has been undertaken and completed for the award Degree of Doctor of Philosophy (Ph. D.) in Library and Information Science. The entire work has been done by me and carried out under the guidance of Dr. Mukut Sarmah, Assistant Professor, Dept. of Library and Information Science, Assam University, Silchar.

I also declare that this thesis has not been submitted before either in part or full by me or others for any degree or diploma or fellowship either in this or any other University to the best of my knowledge.

(Sehnara Begum Choudhury)

Schnora Begum Chaudhwy



E-mail:drmsarmah@gmail.com mukut.sarmah@aus.ac.in Phone:+91-9435193769 (Cell) 03842-270246 (Res.)

## **Department of Library and Information Science**

Swami Vivekananda School of Library Sciences Assam University, Silchar, Assam – 781011

Dr. Mukut Sarmah, BSc (Hons.), MLISc, PhD Assistant Professor

Ref.: .....

#### Certificate

This is to certify that the thesis entitled, "Bibliometric Analysis of Doctoral Theses in Life Sciences Submitted to Assam University During 1996 to 2012", submitted by Sehnara Begum Choudhury for the award of the Degree of Doctor of Philosophy, is a record of bonafide work carried out by her under my supervision, as per the Assam University code of academic and research ethics. The work is of original in nature to the best of my knowledge and belief. The contents of this thesis have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university. The thesis fulfils the requirements and regulations of the University and meets the necessary standards for submission.

Date: 22/02/2016.

(Dr. Mukut Sarmah)

Supervisor

Or. Mukut Sarmah
Assistant Professor
Dept. of Lib. & Inf. Science
Assam University, Silchar

# Acknowledgement

The present research work has been carried out by constant encouragements and guidance of my supervisor, Dr. Mukut Sarmah, Assistant Professor, Dept. of Library and Information Science, Assam University, Silchar. This research project came out in the shape of thesis successfully is only because of his constant guidance in every respect. I owe my deep sense of gratitude and indebtedness to him.

I sincerely and gratefully acknowledge Dr. Manoj Kumar Sinha, HOD, Dept. of Library and Information Science, Assam University Silchar.

I am also thankful to Nabin Chandra Dey, Assistant Professor, Dept. of Library and Information Science, Assam University Silchar and other faculties for their constant support to complete this research work. I am also thankful to my friends and junior student of department for helping me.

I owe a special debt of gratitude to Dr. Subarno Kumar Das, HOD, Dept. of Library and Information Science, Jadaupur University, Kolkata who has heartily encouraged me.

I extend my special thanks and love to my mother Smt. Rahena Begum Chhoudhury and all family members for their constant inspiration for completion of this research work.

I am indebted to my husband Mr. Abdul Kuddus for his constant support and soothing the situation whenever I was in difficulties and distress during my work.

Last but not the least, I am infinitely thankful to my kids Zaheena Tasneem, Beenish Mehraj and Shreeyans Sharma, son of Dr. Mukut Sarmah for their help and passions during my work.

Schnara Begun Chaudhwry

(Sehnara Begun Choudhury)

# **CONTENTS**

Chapters	Content	Page No.
	Title Page	
	Declaration	I
	Certificate by the Supervisor	
	Acknowledgement	III
	Content Page	IV-VIII
	List of Tables	IX
	List of Figures	X
	Abstract	XI-XIV
Chapter 1 I	ntroduction	1-14
	1.0. Background of the Study	1
	1.1. Need of the Study	4
	1.2. Statement of the Problem	5
	1.3. Objectives of the Study	6
	1.4. Methodology	7
	1.5. Techniques of Bibliometric Study	8
	1.6. Scope and Limitations of the Study	13
	1.7. Chapterisation	13
Chapter 2 I	Literature review	15-40
	2.0. Introduction	15
	2.1. National Literature Review	15
	2.2. International Literature Review	31
	2.3 Conclusion	40

Chapter 3 Bibliometrics: Conceptual Framework	41-82
3.0. Introduction	41
3.1. Meaning and Definition of Bibliometrics	42
3.2. History of Bibliometric	44
3.3. Bibliometrics: Genesis of Bibliometrics	45
3.4. Scientometrics	48
3.5. Informetrics	49
3.6. Webometrics	51
3.7. Cybermetrics	52
3.8. Scope of Bibliometrics	52
3.9. Uses of Bibliometrics	53
3.10. Application of Bibliometrics	54
3.11. Bibliometrics Techniques	55
3.11.1. Citation Analysis	56
3.11.1.1. Citations or References	56
3.11.1.2. Techniques Using Citation Analysis	59
3.11.1.2.1. Half-life and Obsolescence	59
3.11.1.2.2. Citation Indexes	61
3.11.1.2.3. Clustering	62
3.11.1.2.4. Bibliographic coupling	62
3.11.1.2.5. Co-citation analysis	63
3.11.3. Publication Counts	64
3.11.4. Direct Citations	64
3.11.5. Self-Citation	64
3.12. Application of Citation Analysis	65
3.12.1. Literature of "Studies"	65
3.12.2. Type of Literature Studies	66
3.12.3. User's Study	66
3.12.4. Historical Studies	67
3.12.5. Communication Patterns	67
3.12.6. Collection Development	68
3.12.7. Obsolescence	69
3.12.8. Predicting Nobel Prize Winners	69
3.12.9. Automatic Classification	70

		3.12.10.	Information Storage and Retrieval	70
		3.12.11.	Evaluative Bibliometrics	71
	3.13	Empiric	al Laws of Bibliometrics	71
		3.13.1.	Latka's Law of Scientific Productivity	71
		3.13.2.	Bradsfords Law of Scattering	74
	Scat	3.13. ttering	2.1 Sengupta's Extension of Bradfords Law of	78
	Bear	3.13.3.	Zipf's Law of Word Occurrence	78
	3.14.	Conclus	-	81
Chapter 4	School o	f Life Sci	ences, Assam University: Research Outputs	83-106
	4.0.	Introdu	ction	83
	4.1.	School	of Life Sciences	84
		4.1.1.	Department of Life Science and Bioinformatics	84
		4.1.2.	Department of Microbiology	85
		4.1.3.	Department of Biotechnology	85
	4.2.	Research	h Outputs in School of Life Sciences	86
		4.2.1.	Subject Wise Doctoral Theses Submitted	87
		4.2.2. Sciences	Number of Theses Submitted to the School of Life	92
		4.2.3.	Year Wise Submission of Theses	93
		4.2.4.	Year Wise and Research Scholar Wise Theses	95
		4.2.5.	Supervisor Wise Theses Submission	100
		4.2.6.	Thesis Wise Citations	103
	4.3.	Conclus	sion	106
Chapter 5	Data An	alysis and	d Interpretation	107-173
	5.0.	Introduc	tion	107
	5.1.	Distribut	ion of Citation by Forms	108
		Thesis Wature	Vise Frequency Distribution of Different forms of	111
	5.3.		g of Journals made on the basis of Citations	115
	5.4.	Ranking	g of Books Made on the Basis of Citations	126
	5.5.	Distribu	tion of Authorship Pattern	129
	5.6.	Single V	s Multiple Authors	132
	5.7.	_	of Collaboration	132
	5.8	Author'	s Productivity	134

	5.9.	Period	Wise and Document Wise Distribution of Citation	136
	5.10	Period	Wise Distributions of Citations	137
	5.11.	Period	Wise Distributions of Citations to Journal	140
	5.12	Period	Wise Distributions of Citations to Books	141
	5.13. Year		Wise Distribution of Citations in Recent Twenty	143
	5.14		Wise and Document Wise Distribution of Citation for t 20 Years	146
	5.15	Block	Wise Distributions of Citations	148
	5.16	Bradfo	ords Zone for Life Science	150
	5.17	Produc	ctivity of Journals in Life Science	152
	5.18	. Rankii	ng of Author for Core Journal	152
	5.19	Rankii	ng of Authors for Book	157
	5.20	Signifi	icant Keywords Used by Scholars of Life Sciences	158
	5.21	Publis	her Wise Number of Journal Citation	161
	5.22	Publis	her Wise Number of Book Citation	162
	5.23	Count	ry Wise Citation of Journal	164
	5.24	Count	ry Wise Citation of Books	166
	5.25	Count	ry-Wise Distribution of Core Journals	168
	5.26	. Half-L	Life Studies of Citations	169
			escence of Literature in Life Science	171
	5.28	Conclu	usion	173
Chapter 6 M	ajor fi	ndings,	Suggestions and Conclusion	174-186
	6.0.	Introd	uction	174
	6.1.	Summ	ary of Major Findings	175
		6.1.1.	Theses submitted in the School of Life Sciences	175
		6.1.2.	Number of Citations Per Thesis	176
		6.1.3.	Average Number of Citations	176
		6.1.4.	Distribution of Document Form	176
		6.1.5.	Ranking of More Cited Document Forms	176
		6.1.6.	Ranking of Core Journals	177
		6.1.7.	Year-Wise Distribution of Citations Pattern	177
		6.1.8.	Authorship Pattern	177
		6.1.9.	Degree of Collaboration	178
		6.1.10.	Ranking of Authors	178
		6.1.11.	Ranking of Publisher	178
		6.1.12. Form	Geographical Distribution of Most Cited Document	179
		6.1.13.	Application of Bradford's Law	179

	6.1.14. Half life and Obsolescence of Literature	179
	6.1.15. Comparison of Researchers' Preferences Between India with Foreign Journals	180
6.2.	Suggestions	181
6.3.	Contribution of the Study	182
6.4.	Scope of Further Research	183
6.5.	Conclusion	183
References w	ith APA Style	187-216
Appendix		217

### LIST OF TABLES

TABLE NO.	NO. TITLE	
3.1.	Evolution from Bibliography to Bibliometrics	41
3.2.	Bradfords Zones	70
4.1.	Subject Wise Doctoral Theses Submitted	83
4.2.	Department wise theses Submission	87
4.3.	Year Wise Submission of Theses	89
4.4.	Year Wise and Research Scholar Wise Theses	91
4.5.	Supervisor Wise Theses Submission	96
4.6.	Theses Wise Number of Citations	98
5.1.	Frequency Distribution of Different Forms of Literature	104
5.2.	Thesis Wise Frequency Distribution of Different Forms of Documents	107
5.3.	Ranking of Journals made on the basis of Citations	111
5.4.	Ranking of Books Made on the Basis of Citations	122
5.5.	Distribution of Authorship Pattern and Degree of Collaboration in Journals	126
5.6.	Contribution of First Author in Journal (Author's Productivity)	130
5.7.	Period wise and Document wise distribution of Citations	132
5.8.	Period Wise Distributions of Citations	133
5.9.	Period Wise Distributions of Citations to Journal	135
5.10.	Period Wise Distributions of Citations to Books	137
5.11.	Year Wise Distribution of Citations for Recent 20 years	139
5.12.	Year Wise and Document wise Distribution of Citation for Recent 20 years	142
5.13.	Block Wise Distribution of Citations	144
5.14.	Distributions of Journals in Life Science Based on Bradfords Law of Scattering	145
5.15.	Productivity of Journals in Life Sciences	147
5.16.	Rank List of Author for Journal	148
5.17.	Rank List of Author for Book	152
5.18.	Significant Keywords Used	154
5.19.	Publisher Wise No of Journal Citation(Rank 25)	156
5.20.	Publisher Wise No. of Book Citation (Upto 15 <sup>th</sup> Rank)	157
5.21.	Country Wise Citation of Journal	159
5.22.	Country Wise Citation of Books	161
5.23.	Country-wise distribution of core journals	163
5.24.	Citation Half-Life	165
5.25.	Obsolescence of Citations	166

# LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
4.1	No. of Theses Submitted in Three Departments	88
4.2	Year of Theses Submission	90
4.3	Supervisor Wise Theses Submission	97
4.4	Thesis wise No. of Citations	100
5.1	Different Forms of Cited Documents	105
5.2	Different Forms of Documents	106
5.3	Book Vs Journal	109
5.4	Core Journals Based on Frequency Distribution of Citations	120
5.5	Ranking of Books Based on the Frequency Distribution of Citations	124
5.6	Distribution of Authorship Pattern	128
5.7	Period Wise Distributions of Citations	134
5.8	Period Wise Distributions of Journals	136
5.9	Period Wise Distributions of Citations to Books	138
5.10	Year Wise Distribution of Citations for Recent 20 years	140
5.11	Bradfords Distribution of Journals	146
5.12	Ranking of Authors of Journals	151
5.13	Ranking of Authors for Books	153
5.14	Significant Words Used by Scholar in Life Sciences	155
5.15	Country Wise Citation of Journals	160
5.16	Country Wise Citation of Books	162
5.17	Obsolescence of Literatures in Life Sciences	167