Chapter-II

LITERATURE REVIEW

Mary K Sellen (1990) Selective and based upon the Library of Congress classification system, entries cover the universe of Bibliometric research from 1970 to 1990. Entries are organized according to the disciplines in the sciences, technologies, social sciences, and humanities. Among these entries, library and information science constitutes a sizable portion. Both theoretical and applied studies constitute the majority of entries, with a concerted attempt to gather representative studies. As the majority of Bibliometrics appears in journals, it is not surprising that a vast majority of entries are articles.

Borgman (1990) once noted that Bibliometric studies can be classed according to which element of the scholarly communication system they studied (that is, the units of analysis under consideration). She identified three main types of units: producers (the author of a document or aggregates of authors, such as institutions and

Klaic (1990) the research activity of chemists from 'Rugjer Boskovic' Institute (Zagreb, Yugoslavia) was analyzed for the period 1976-85, covering 1149 SCI registered papers. The papers were published in 235 different journals, most frequently international croatica chemical Acta (171 papers). The publication was divided into 2 groups: for the period's 76-80 and 81 to 85 and for the each paper citation collected in the respective time period. An average publication had 2.58 citations. Chemical papers from the second period had 2.73 citations per paper, which was considerably more than Yugoslav papers, in general. The distribution of citations was analyzed

Zhuk et al., (1990) discussed the Scientometric study of the information flow in the field of Plasmochemical synthesis' and 'polymer membranes' recorded through Data star and STN. The results show that the first paper on 'Plasmochemical synthesis' was published in 1976. The very high growth rate of the published literature is the result of an increasing interest in the two fields as well as of a theoretical basis created in the 1970's.

Patel, D.R (1991) this paper provided definitions and descriptions about Bibliometrics its lass and scope, citation analysis and Bibliometrics, etc. Describe the
importance of science citation index (SCI), Journal Citation Report (JCR) and their various parts; discusses the methodology used to retrieve information using SCI CD-ROM and elucidates the various search carried out

**Usha Mujoo-Munshi et al. (1991)** carried out an analysis of references cited by the scientists of India, USA, UK and Canada in a few selected journals of chemistry and chemical technology to evaluate the effectiveness of the information system of these countries and also to find out how the availability of journals affect the citation practice. The authors found that Indian authors, generally, cited older references; whereas, the American authors quoted more recent literature irrespective of their place of work. However, the citation practice of British and Canadian scientists was in between USA and India.

**Garg and Dutt (1992)** analyzed the papers published by Indian agricultural scientists in Indian and non-Indian journals in the year 1984 downloaded from different data bases (Agrindex: Indian Science Abstracts (ASI), a monthly publication of the National Scientific Documentation Centre (INSDOC), New Delhi and Science Citation Index (SCI, published by the Institute for Scientific Information, Philadelphia, Pennsylvania, USA. The authors concluded that the majority of Indian agricultural research output appeared to be in plant sciences and in livestock to evolve high yielding strains of livestock. The major share of papers published was from Agricultural universities. They recorded the number of research papers Pertaining to dairy science and animal husbandry including veterinary sciences published in Indian journals and SCI covered non-Indian journals as 1,029 and 17 respectively totaling to 18 per cent of all the articles covered. They opined that the scholarliness of Indian research publications was satisfactory when measured by the impact factor.

**Mundhe (1992)** screened 1,686 veterinary science contributions of different subjects for the years from 1981 to 1988 that appeared in Commonwealth Agricultural Bureau (CAB) Abstracts the Veterinary Bulletin, covering 29 journals. From authorship analysis of the articles, the author observed growing importance of collaborative research. The source analysis of the articles revealed that 99 per cent of references were from the journals. Considering the productivity of the journals included, the Indian Veterinary Journal and the Indian Journal of Animal Sciences were ranked first and second, representing 23.25 and 17.85 per cent of the articles respectively.
Kademani, B.S., Kalyane, V.L.Kademani, A.B (1994) Dr.C.V.Raman's publications were analyzed by year collaboration pattern, channels of communications used, etc. The results indicated that the temporal variation of this productivity and of the types of paper published by him was eminently qualified to be taken as a 'role model' for the younger generation to emulate. He had to his credit 94 papers in 'Scattering of Lights', 55 papers in 'Acoustics', 66 papers in 'optics' and 85 papers in 'floral color and visual perception'. The highest collaboration coefficient was 1.0 during 1936 to 1940 self-citations rate for his publication was 15.05

Sinha, S.C and M.D.Furqun Ullah. (1994) analyzed articles of Dr.I.N.Sengupta quantitatively. This article analyzed 102 publications of Dr.I.N.Sengupta covering the period 1969 - 1992. In 1988 Dr.I.N.Sengupta wrote 14 papers which was considered as peak period of his writing. He suggested that Dr.I.N.Sengupta preferred to publish 11 articles in Indian Journal of Information Science followed by 10 articles published in IASLIC Bulletin.

Ullah (1994) investigated the contribution of Indian hydrologists and experts in water resources to 100 volumes of the Journal of Hydrology, for the period 1981 to 1993, with regard to major disciplines, authorship patterns of articles, research collaboration, institution-wise output and authors' identification. A large number of contributions come from Indian authors with a large proportion of the output coming from a few organizations. Indian hydrologists are principally concerned with groundwater related issues.

Rana and Agarwal (1994) reported the authorship and collaborative research patterns in Indian wildlife and fisheries disciplines based on the data collected from "Wildlife Review and Fish Review" published between 1980 and 1989. The proportion of single authored papers was found decreased from 63.68 per cent in 1980 to 52.74 per cent in 1989. During the same period there was an increase in the average number of authors per paper from 1.57 in 1980 to 1.70 in 1989. The degree of collaborative research also increased from 0.36 to 0.47. The trend towards collaborative research was seen increasing during 1980-89.

Kanungo, T. (1995) conducted a study on citing patterns of Indian political scientists in the Journal Indian Journal of political science for the period 1990-93. 3509 citations were cited for 119 articles. The analysis revealed that 88.37% authors
were Indian; only 111.63% belong to Foreign Countries. There were 89.08% single author and 10.92% had two or more authors. The score of self-citation constituted 1.82% and author self-citation 24.03%. Periodicals as source of Information were 18.97%. Out of which 41.86 were Indian and 58.14% were Foreign

**Bossy (1995)** suggested how Netometrics, as she called it, could supplement Bibliometrics and Scientometrics in observing "science in action" on the Internet, enabling account the cooperative aspect of science". However, she made no empirical investigation of academic web spaces in the paper

**Mukhopadhyay, Parthsarathi. (1995)** Webometrics investigation at different level of domain name system. This study is based on the analysis of hyperlinks.

**Dalai and Ramesh (1995)** carried out Bibliometric analysis of papers published in the Journal of Scientific and Industrial Research during the years from 1988 to 1993. The authorship pattern, year-wise distribution, subject of coverage, organization—wise distribution, study of references, average length of the articles, contribution from India and abroad etc. were analyzed. The study revealed that the journal covered very wide areas of technology and the relative proportions of contributions in different fields of science and technology in the journal such as Applied Science (12.62%), Management of Sciences (13.22%), Computer and General Science (2.70%), Current Trends in Science and Technology (5.10%), Research and Progress in Industrial Development (13.22%), and Conferences, Lectures and Symposia on Industrial Policy and Activities (9.30%).

**Larson (1996)** was one of the first information scientists to perform an investigation of link structures in academic web spaces. He used AltaVista in a co-citation analysis of a set of Earth Science related web sites and could produce clustering of web sites that had topical similarities

**Cheng Huanwen. (1996)** analyzed formally published journal articles in library and information science (LIS) in China from 1985 to 1994. The aim is to study how research articles were distributed over various topics, what research

**Mubeen, M.A. (1996)** analyzed citations of 22 doctoral dissertations in chemistry submitted to Mangalore University since its inception. The study has identified 60 score journals, out of total 418 journals, referred to by the researcher. Of the Citations
73% pertained to journals, 11.84% to books, 9.24% to patents and the rest 6.28% to technical bulletins, thesis, etc. Of all the countries, USA dominated for 30.2% citations, India followed next with 20%, and UK occupied 19.31% and rest by other countries. Single author contributions aggregated 27.49% citations, two authored contributions with 22.66% and three-authored contribution with 15.36%.

**Leta J. and Meis L.D. (1996)** Observed the Brazilian contribution to publications in science and humanities increased from 0.29 percent of the worldwide total in 1981 to 0.46 percent in 1993. In science, but not in humanities, Brazilian publications tended to follow the world publication trend; thus, during the period 1981-93, 57.9 percent of Brazilian publications were in life sciences, 35.4 percent in exact sciences, 3.9 percent in earth science and 2.9 percent in humanities, which account for half of all the Brazilian Publications. The Total number of authors on the Brazilian 1981-93 publications was 52,808. Among these 57.8 percent appeared in only one publication and 17.5 percent had him publications cited more than 10 times.

**Almind & Ingwersen (1996)**, in a paper introducing the term webometrics, applied a variety of Bibliometric-like methods to the Nordic portion of the Web in order to observe the kinds of page connections and define the typology of web pages found at national Nordic level.

**Bandyopadhay, A.K. (1996)** conducted a Bibliometric study of the citations in 27 doctoral dissertations in mathematics submitted at the Burdwan University from 1981-1990. The bibliographic forms of literature used, ranked list of journals in pure mathematics, applied mathematics and statistics, normalized ranking of journals with corrected citation number according to Sengupta's formula were presented. In the source wise distribution, journal articles shared 78.58% and 16.31% by books. A list of 384 journals cited with 35 ranks was generated.

**Cahlik and Jioina (1996)** demonstrated the use of the scientific field of artificial neural networks, an approach to dynamic analysis of scientific fields. A computer program Lexidyn has been developed to make the dynamic analyses possible. Seeing the evolution of a scientific field through time can be a help in evaluating potential of further research in a given field or in some of its themes. (1994) examined turning under the aegis of our (former) classic once again: The
World is ruled by spontaneity which escapes rationally oriented science. Indeed, it is worth having a choice occasionally.

Deshpande, M. and Rajyalakshmi, D. (1997) conducted a study of 65 dissertations in Library and Information Science submitted to Nagpur university during the Period 1990-94. Citation analysis had been carried out to find the types of cited source materials, authorship pattern and chronological distribution of cited references. The ranked list of journals indicated that the Annals of Library Science and documentation was the most cited journal shared 3.23%, IASLIC Bulletin and college and research Libraries shared 2.67% each. Journal source material shared 68.74%, books shared 16.4% and rest by thesis, reports etc.

Sudheir, K. G. (1997) conducted a quantitative treatment of the characteristics and behaviour of scientific research output in Kerala during 1979-94 to find out the growth rate of literature, subject wise distributions of publications, authorship pattern, relative contribution of institutions and scientific productivity.

Kiran Kaur, Lily Lee, Tiew Wai and Sin B. K. Sen (1997) conducted a Bibliometric study on Titles of LIS Textbooks and Research articles. The number of Keywords in 100 Titles of LIS Textbooks totaled exactly 500, and those in 100 research articles 770. On an average the number of keywords in the titles of research articles and textbooks are 7.7 and 5 respectively and prove the hypothesis that the number of keywords in textbook titles is less than that of the research article titles.

Biradar, B. S and Vijayalaxmi, T. (1997) discussed the pattern of information used by researchers in the field of Neurology. They identified the average number of references per dissertation as 93, the use of different source of information and stated the obsolescence of literature. Source wise distribution revealed that 80.20% of citation belonged to the periodical articles followed by books 17.36%. The published sources had contributions with more than two authors as 79.35%.

Rousseau (1997) analyzed the patterns of distribution of web sites, site in links and site self-links ('self-citations'). Rousseau's study operated with 343 web sites retrieved in AltaVista with the search string, Informetrics OR Bibliometrics OR Scientometrics. The study showed that the distribution of TLDs (top level domains, such as.edu, .uk, .dk) for the investigated sites followed the ubiquitous power-law-
like Lotka distribution. Similarly, Rousseau demonstrated that the distribution of in
links to the 343 sites also followed a Lotka distribution

Cunningham (1997) has presented the results of an examination of a selection
of published European evaluations. The incidence of quantitative and Scientometric
approaches has been reviewed and an assessment made of their contributory role in
each evaluation. The various approaches have been broadly categorized according to
the type of data they draw upon, and by the issues they attempt to address. The author
analyses such approaches with regard to the degree of 55 successes in meeting the
objectives of the evaluation. In the light of this some likely future trends are
suggested.

Van Raan (1997) argued that the core research activities of Scientometrics
fall in four interrelated areas: science and technology indicators, information systems
on science and technology, the interaction between science and technology, and
cognitive as well as socio-organizational structures in science and technology. He
emphasizes that an essential condition for the healthy development of the field is a
careful balance between application and basic work, in which the applied side is the
driving force. In other words: Scientometrics is primarily a field of applied science.
This means that the interaction with 'users' is at least as important as the interaction
with colleague-scientists. He states that this situation is very stimulating, it
strengthens methodology and it activates basic work. He considers the idea of
Scientometrics lacking theoretical content or being otherwise in a 'crisis-like' situation
as groundless. Scientometrics is in a typical developmental stage in which the
creativity of its individual researchers and the 'climate' and facilities of their
institutional environments determine the progress in the field and, particularly, its
relation with other disciplines.

Haiqi and Yuhua (1997) The survey by is based on the data recorded in the
Science Citation Index (SCI) database between 1987 and 1993, and it is intended to
study the research performance in the People's Republic of China. The 35,087 papers
56 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 China. The findings indicate that 17,687
papers covered by the Source Indexes of the SCI in the period 1990-1992 had
received 7944 citations in the year 1993 and that the mean citation rate is 0.45. The
number of cited papers is 4491 and the proportion of cited papers to the total is 0.25. Research performance in China 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.

Zitt, Perrot and Barre (1998) described this trend using a model of transition. They suggested that researchers are moving form 'national’ to 'transnational

Hajudin, S. (1998) analyzed articles published in the journal of Plantation Crops during the period 1973-1996 to find out the nature of communication, geographical distribution, authorship pattern and citations. Indian authors had contributed 89.96% and foreign authors had contributed 10.04% articles. The maximum number of contributions was on coconut! 67 (29.93%). central plantation crops research Institute had contributed 42.83% of the total contributions. Two author papers had accounted 38.17% followed by the three-author papers 26.34%.

Damodharan, T (1998) reported results of a Bibliometric study of doctoral thesis on aspects of the growing and use of Groundnuts in India, which 38 aimed to find out Doctoral Dissertations in India in terms of year wise, crop wise and discipline wise growth during the period 1948-1996. Total state agriculture Universities published 70% thesis and 20% by the conventional Universities in India. It was observed that around 45% of the total thesis was generated in the two important disciplines of crop production and crop improvements.

Ingwersen (1998) calculated the WIF for some Danish domains and websites. He used AltaVista for his study because he believed this search engine covers a broad area of the web and provides sufficient information for webometrics studies

Khan, M.S.I., Ahmed, S. M.Z., Mimshi, M. N.U. and Akhter, N. (1998) presented the results of statistical and Bibliometric analysis of the articles published on various aspects of Library and Information Science (LIS), emanating from Bangladesh during the period 1966 to 1997. The results of the study showed that, during 1966-1997. A total of 308 articles, authored by 116 librarians were published in various periodicals with the highest number 256(83%) from Bangladesh, followed by India 21(6.823%). All these papers were published in 37 periodicals originating from 14 countries. About 92% of the articles were credited to the single authorship and only 25 articles were coauthored.
Devaraai Rajasekhar, S., Ramesh, L.S.R.C.V. and Hussain, M.V. (1998) analyzed M.V.Srinivas's Publications by year, domain, authorship pattern, Channels of communications used etc. By the end of 1995, Srinivas had to his credit 144 papers which included 33 broad papers in sociology and anthropology; 18 papers in social change; 28 papers on village studies; 12 papers on religion; 17 papers on caste and 36 papers on general popular interest. Indian publishers published 119 (82.64%) articles; foreign publishers published 22 (15.28%) articles and 3 (2.08%) articles by both.

Kumbar, M. and Akhtary, S. (1998) analyzed 7451 citations appended to 322 articles published in the American Journal of Ophthalmology Vol.117-120 during the years 1994-1995. The average number of citations per article, types of literature authorship pattern, obsolescence of literature, and a ranked list of cited periodicals were observed. Results indicated that major type of document cited was periodicals as 682 (91.63%); authorship pattern showed the highest contribution made by 3 authors (72%). Going back by 25 years in this field of research accounted for 6192 citations (90.17%); the US journal of Ophthalmology had the highest overall number of citations at 998 (14.62 %).

Tiew and Wai Sin (1998) analyzed articles published in the Journal of Natural Rubber Research during the period 1987-1996 to find out the authorship pattern, the range and frequency of references cited, the extent of acknowledgement & appendix and the type of collaborative research. Multiauthored research paper is 72.1%. The range of references cited 16.49%, 74.81% contained formal acknowledgement and 7.75% of research articles contained appendix. The collaborative paper among natural rubber researchers is quite high at 72.09%.

Ramesh Babu and Nandini Muthusamy (1998) have conducted a Bibliometric study of the articles published in the "International Library Review" during 1987-1991. The contributions to an issue devoted to 'Scientometrics in India', asserts that patents are a useful source of scientific and technological information as examined by Gupta (1999) attempted a Bibliometric analysis of patents in order to identify technological trends in the area of fullerenes and to study other parameters such as growth of patenting activity, and active players in the field from industry, academia and government research institutions.
Wormell (1998) is one of the exceptions that offered a more in-depth analysis of LIS journals’ internationality. Wormell examined seven LIS journals and explored the relation between the distribution pattern of authors, citations and journal subscriptions. The author found that the ‘core international LIS journals were not as international as their reputation claimed to be’. Cronin and Shaw (1999) offer further perspectives on journal internationalization. Their study analyzed four journals in terms of author's geographic location, citations, and acknowledgement of funding sources. They found that most first authors were based in the North Atlantic countries (513 out of 716 articles). Worth highlighting is that authors from the 'Rest of World' were found

Ezhil Rani (1998) analyzed the fishery sciences research papers published in the Indian Journal of Fisheries during the years 1987 to 1991. Out of the total 288 contributions, 101 (35.07%) were by scientists of international and national universities, 51 (17.71%) from colleges and 136 (47.22%) were from research stations. The authorship trend of the papers revealed highest for single-authored papers (36.11%). Thirty-five frequently referred journals by the scientists in fishery sciences were listed and ranked. Roper (1999) while analyzing the pattern of citations in Veterinary Sciences articles, to overcome the shortcomings of the SCI (in taking account of non-journal literature, the bias towards English language and US journals and so on) preferred manual (numerical) enumeration (Microsoft Excel Spreadsheet) of references cited in 38 major scientific papers published in the Veterinary Record and Journal of American Veterinary Medical Association for one month each in 1995 and 1998 (a sample of 5% of the total output of these two journals). Out of the 776 references 80 per cent were of journal articles, the author observed that the Veterinary Medicine and Surgery subjects, being not self-contained fields, cited wider biomedical literature extensively. Further, the author opined that the researchers were using low level of electronic resources of the global network environment.

Narendra Kumar and Ramesh Babu (1999) analyzed the literature published in 'ILA Bulletin' during the year 1986-1996 discussing authorship pattern, citation pattern, subjects covered, ranking of the contributors, nature of contributions, bibliographic forms, of cited documents etc..

Newsmonger (1999) identified 178 articles ranking LIS journals. Such studies continue to be popular, particularly as a method for identifying the core journals in the
field. Some journals feature consistently in such studies: Nisonger's (1999) meta-analysis of 178 ranking studies identified JASIST as the

Lipetz (1999) studied the Aspects of JAS1S Authorship by examining the volume of five decades from 1955 to 1995. His findings revealed that, the number of scholarly papers published per year in JASIS has grown-up from 21 to 68, the authorship pattern has also grown from 34 to 130 with a doubling time of about 20 years which is similar to the growth pattern of JASIS papers. Authors were collaborated in the formation of new papers and international authors have significantly increased their productivity. Academic affiliation also increased from less than 25% in 1955 to 90% in 1995. From 1955 to 1965, the average number of citations per paper dropped from 8.3 to 7.0; but the ratio increased rapidly thereafter to 30.5 in 1995.

LAN Rowlands (1999) conducted a Bibliometric investigation into the structure & dynamics of the information policy journal literature. The unit of analysis is a document test collection of 771 articles published between 1972-1996. The investigation focuses on patterns of growth, knowledge accumulation, ageing and obsolescence, documentary scatter and knowledge production. It concludes that the structure and dynamics of the information policy journal literature diverges in several respects from typical social science literatures. Information policy is characterized by very rapid growth, high immediacy (in Price's sense), rapid reception and ageing processes and relatively low documentary scatter.

Barooah, P.K., Begum, D. and Sharma, N.N. (1999) conducted a Bibliometric analysis on 4253 citations collected from doctoral dissertations submitted to various universities by the S & t workers worked in the area of Organic chemistry during 1977 to 1997. It was observed that major citations were from journal literature (85.42%) although citations from books, Proceedings, patents reports and thesis were also found. The half- life of literature in the field of organic chemistry was found to be 27 years

Herubel, Jean-Pierre V. M. (1999) explain that researchers can examine literature and establish characteristics of disciplines, obsolescence of scholarship, institutional affiliations and relationships, and types of materials constituting scholarly pursuits. Bibliometrics is used as a methodology in many fields of science, primarily to map the publication pattern in different disciplines. For instance for the historian studying the intellectual heritage and evolution of a discipline Bibliometrics is an indispensable tool. (Herubel, Jean-Pierre V. M., 1999)

David Stuart, 2011 wrote in Research Information, "it is also important to recognize that the value of library data is not limited to the direct provision of the library services, but can contribute to the overall information and research systems. He further mentions that there is increased interest in the potential of Bibliometrics and webometrics to provide objective indicators of researchers' outputs and identify emerging areas of research interest.

Ramakrishna N.V. (1999) carried out a research on "Bibliometrics of animal cell culture technology literature: a study based on the animal cell biotechnology “this study identifies core and significant literature for animal cell culture technology based on the citation called from the serial publication Animal cell biotechnology. In addition to determining country, subject, physical format, chronological distribution of core journals in Animal cell culture technology, obsolesce and citation peak of journals is also worked out. The scattering of literature in subject is determined by verifying Bradford's Law.

Karki and Garg (1999) attempted to assess the performance of Indian organic chemistry research during the 70s and 80s. It identifies the significant work 54 and its impact using mainstream connectivity, surrogate measures of quality and relative impact indicators. It is observed that the organic chemistry research performed in India during the later period (80s) has improved slightly as compared to the previous period (70s).

Garg and Padhi (1999) have analyzed 4650 publications abstracted in Journal of Current Laser Abstracts Vol. 27 (April 1990-March 1991) and it indicates that 14 countries contributed about 94% of the research output with USA topping the list followed by Japan and the erstwhile USSR. Technical reports and patents, besides articles in scientific journals constitute an important source of information on laser
science and technology. "Spectroscopy of laser output" is the sub-specialty which has received maximum emphasis. USA has paid almost equal emphasis for theoretical, experimental and applications of laser research, while such pattern is not applicable for other countries. For USSR, China, and India, the impact of research did not commensurate with the publication effort.

**Thomas & Willett (2000)** studied UK library and information science departments, finding no significant correlation between in link counts and research ratings.

**Sivasubramanian, V. (2000)** reported the results of a Bibliometric study of articles published in the Journal of Indian Coffee, which has been published by the coffee board. Analyzed the authorship pattern, the range and frequency of references cited and year wise distribution of papers. Most of the articles dealt with topics plantation, cultivation and processing in the first order i.e. 22.46% followed by standards and quality as 15.26%. The average length of papers ranges between 1 to 6 pages, which constituted 92% of the whole. Results indicated that the trend was towards single authorship as 64.08% and there exists a high degree of collaboration in coffee research

**Mahapatra, G and Das, B. (2000)** analyzed the nature of growth of literature on geology between 1987-1996. Examined the type of collaboration among authors and the trend of growth, the degree of collaboration among various categories of authors, correlation of the growth of various categories of authors, and the impact of collaboration on the growth of literature. In the year-wise publication analysis the year 1989 attained the peak of value 551 (11.45%) publications. In the authorship pattern 36.58% were contributed by two authors, 29.16 5 were contributed by single authors and the rest by three and more than three authors

**Biradar, B.S and Mathad, S. (2000)** conducted a study based on the references appended to articles appearing in the journal 'Annual Review of Ecology and Systematics' for the year 1995-1996 and identified the major forms of literature, core journals, authorship patterns, obsolescence of literature etc. Results indicated the information that the largest number of citation were from American Literature (63.96%); Single author papers amount to 34.69%; more than 80% of the citations had been publish
Tiew, S. (2000) analyzed the extent of periodical self-citation and author self-citation in the research articles and short communications published in the 'Journal of Natural Rubber Research' during 1988 to 1997. Results showed that 535 of articles contained periodical self-citations and the rate of periodical self-citations per article ranged from 1 to 12. A high percentage of authors 6.145 who contributed articles to the periodical cited themselves. Furthermore there was a tendency for authors, affiliated to the institution publishing the periodical, to cite the periodical. A total 214 papers (64.08%) out of 334 had been contributed by single authors by single authors, 55 papers (16.46%) by two authors; 39 papers (11.68%) had been contributed by three authors and 26 papers (7.78%) were contributed by more than three authors.

Garg, K.C. and Padhi, P. (2000) analyzed 766 publications by prolific authors in scientific journals indicates that prolific authors produce about 25.5 of the total scientific output in periodical literature in Laser Science and Technology. The average productivity per author was about Prolific authors from most of the countries belonging to either academic or research institutions except in USA and Japan. Prolific authors on average made more impact than non-prolific authors. However, the situation varied from country to country.

Kademani, B.S., Kalyane, V.L. and Vijai Kumar. (2000) in their paper analyzed the citations to the publications of Vikram Sarabhai, using Science citation Index 1944-1991. The extent of citations received, in terms of the number of citations per paper and the categories of citing documents and the distribution of citations among them were determined. Vikram Sarabhai had received total 533 citations in the domain; 'Cosmic Ray' (518) and 'Science Policy and National development' (15). Journal articles had cited publications of Sarabhai 391 times, which was 73.36% of total citations. Reviews had cited 62 times which was 11.64%. Mean citations per year were 12.11. Total team self-citations were 37.07%. Highest total team self-citations were found in 1971, 1972 and 1970 having 29, 16 and 15 citations respectively.

Ramesh, L. S.R.C.V., Ramana, P.V. and Hussain, M.V. (2000) analyzed the papers published in the quarterly International Rice Journal 'Oryza' between 1986-1995. The yearly distribution of papers, authorship patterns, geographical location of contributors, subject covered, average length of articles etc. were analyzed. Author affiliations emphasized the dominance of Indian authors as 96.8% and the multiple
authors as 87.82% belonging to academic Institutions. The degree of collaboration was 0.95% in 1995 and 0.84% in 1989

**Suryanarayana Y (2000)** in this paper the author explains, in formation personal are concluding studies on citation analysis or Bibliometric analysis in subject areas of their institution for knowing the extent of utility of journals, monographs, conference proceedings and other literature available in the library., the present article on Bibliomertic analysis of contribution of journal of tobacco research was done for the year 1987-97. Discuss the type of contribution and their distribution over the years

**Roth (2000)** have been studied a citation analysis of the ACR proceedings a knowledge development and social exchange perspective. They examine the citation analysis used in assessing the scientific status of consumer research publication. Lister and Illona Box (2007) have analyzed a study on citation analysis of the SIGCSE 2007 conference proceedings. They are examines most commonly cited references, journals and books among the 1398 citations made in the 122 publications of the SIGCSE 2007 proceedings. In these proceedings the authors cited a very large array of conferences, journals and books, but the majority is only cited within a single paper. Most books cited are concerned with technical information or are textbooks. Only 2% of books are concerned with computer science education and 23% with education in general. Cynthia Lisee and others (2008) have analyzed a study on conference proceedings as a source of scientific information: a Bibliometric analysis. They examine the scientific impact and aging of conference proceedings compared to those of scientific literature in general.

**Dhiman (2000)** has done ten year Bibliometric study Ethnobotany Journal published during 1989-1998. In this paper examines year-wise, institution-wise, country-wise, authorship pattern, range of references cited and length of the articles. Single journals have been the focus of many Bibliometric and Scientometric studies, a number of contributors have conducted Bibliometric analysis of library and information science literature in different countries around the globe. According to an estimate 21 single journal studies in LIS are reported

**Vinkler (2000)** has reviewed that the evaluation of real Scientometric systems needs compromises among the parties interested and between the practical applicability and the theoretical requirements of Scientometrics. In the Chemical
Research Center of the Hungarian Academy of Sciences, special Scientometric indicators have been used for evaluating publication activity of research teams for about 30 years. Modified Garfield impact factors for journals as well as relative citedness of papers are applied as indicators because of differences among subfields in Scientometric features of the publications assessed.

**Jansz (2000)** revealed in 1988 Le Pair postulated the existence of a citation gap for technological research. Several cases were studied, which confirmed his hypothesis. In the same period the use of Bibliometric indicators for policy purposes increased. Here he saw the citation gap causing a disadvantage for application-oriented research groups. This is not merely an injustice; it also leads to sub optimum use of available funds, to the detriment of science as a whole. In addition, it may, in the long term, undermine the reputation of Scientometrics as a science in its own right.

**Garg and Padhi (2000)** have analysed of 766 publications by prolific authors in scientific journals indicate that prolific authors produce about 25% of the total scientific output in periodical literature in laser science and technology. The average productivity per author is about 2. Prolific authors from most of the countries belonged either to academic or research institutions except in USA and Japan. Prolific authors on average made more impact than non-prolific authors. However the situation varied from country to country.

**Sinha and Dhiman (2000)** noted that the Science Citation Index (SCI) had utterly failed in covering the Indian journals, though a large number of papers in science, technology and allied fields were published in Indian origin science journals. As the authors opined that there was no reason to conclude that Indian papers were facing more rejection in SCI. Biradar and Sujatha (2000) reported the citation analysis of Annual Review of Ecology and Systematic for the year 1995 to 96. The study showed that maximum number of citations was from the USA (63.97%); single author papers were 34.69 per cent of the citations and that more than 80 per cent of the citations fell in the age group of 0 to 15 years. Periodical articles formed the major source of information on research in Ecology. Among the 23 most cited journals the Evolution occupied the first rank.
Jayashree and Arunachalam (2000) examined the nature of research carried out in fisheries and aquaculture in India through mapping of six databases for the period from 1994 to 1999. The authors concluded that research in fishery sciences in India appeared to be mediocre, although the Indian research output accounted for about 5.5 per cent of world publications on fisheries.

Aditya Kumari and Shivaram Rao (2000) reported bibliometric evaluation of the Nucleus, an international journal of Cytology and allied topics, in order to find out the most frequently cited periodicals by the biological scientists in India. The citations revealed that collaborative research was preferred to solo research. The contributions of the scientists were found scattered in 299 journals. Among the cited journals the Cytologia occupied the first rank accounting for 7.63 per cent of the total number of citations, followed by the Chromosoma (6.89%) and the Nucleus (3.82%).

Mahapatra, and Bhagwan Das (2000) evaluated the growth of literature in Geology journal during the years 1987 to 1996. The authors noted that increase in collaboration and the rate of growth of publication was low. Sivasubramanian (2000) based on bibliometric study of Journal of Indian Coffee noted that lack of citations in majority of the papers published in the journal, and the citations found in the papers were of very old documents, indicated either the scientists did not have access to new research publications in their institution or they were not using latest information sources of information for their research. They further observed that majority of the papers in the journal were of 1 to 6 pages (82.22%) with nil references or citations (81.43%) and single or two authors (80.54%).

Ramesh et al. (2000) analyzed the research papers published in the quarterly journal of international rice journal the “Oryza” for the period from 1986 to 1995. Among a total of 895 papers, Agronomy and Plant Breeding were the most widely covered subjects. The authors opined that the journal played a vital role in analyzing the advancement of Indian agricultural research particularly in reference to paddy crop/rice. Manorama Tripathi and Prasad (2001) evaluated the comparative information seeking behavior and use of information sources between the physical and social scientists. The authors made an important observation that the two groups of distinct scientists had distinct characteristics with regard to the use of media and other information sources, where the physical sciences scientists depended on various forms of bibliographical sources, contrary to the social sciences scientists.
Hawkins, Donald T. (2001) the bibliometric Characteristics of electronic Journals (e-journals) Covering the field of information Science have been studied. Twenty eight e-journals were identified and ranked by number of article on the subject they published. Webometrics is defined as: "the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the Web, drawing on bibliometric and informetric approaches".

Wagner-Dobler (2001) examined the series of collaboration trends indicated through co authorship since 1800 in mathematics, logic and physics. In physics, the share of co-authored papers expanded in the second half of the 19th Century, in mathematics in the first decades of the 20th century and in logic in the second half of the 20th century. Sub disciplines of mathematics, physics, and logic showed large differences in their respective propensities to collaborate.

Das (2001) observed the collaboration pattern in computer science research in India. The study covering 1408 research papers was published in international journals on computer science contributed by Indian scientists from 1991 to 2000. The domestic and international collaboration patterns have been studied and reported that USA, Canada and Germany were the collaborative countries. Among the Asian countries, India collaborated mostly with Japan followed by Singapore and found that India had the potential of carrying out computer science research of international standard.

Cronin (2001) revealed the idea of a unified citation index to the literature of science was first outlined by Eugene Garfield in 1955 in the journal 'Science'. Science Citation Index has since established itself as the reasonable standard for scientific information retrieval. It has also become the database of choice for citation analysts and evaluative bibliometricians throughout the world.

Garg and Padhi (2001) studied the publication trends in laser science, covering 3174 papers published in journals in the field of laser science and technology indicate that only 401 papers were single authored and the rest 2773 were co-authored papers. Out of 2773 papers, 687 were written in local (inter-departmental), domestic (inter-institutional) and international collaboration.

Pantelis Kalaitzidakis, et al (2001) conducted a worldwide ranking of academic institutions that produce research in a list of 30 top research journals in
Among the principal contributions of the present study is the computation of the ranking of journals for the same period for which we conduct our ranking of institutions. Hence, we do not rely on weights that were computed for research carried in earlier periods. Updating the ranking of journals to agree with the period over which the ranking of universities takes place avoids possible biases that may arise in journal weights that do not take into account the current trends in the economics profession. We have noted a trend worldwide for a more evenly distributed generation of academic research in economics. European academic institutions are well represented in the group of the top 200 universities in the world and so do universities from Asia and the Far East in particular.


Barooah, P.K. and Sharma, N.N (2001) analyzed the journal collection of the library of Regional Research Laboratory Jorhat (RRLJ) through a study of use of journal titles or publication of research by the scientific community of the laboratory. Journals ranked on the basis of their use for individual groups and percentage of used journals was shown. Observed data revealed that 79 papers were published in the year 1992 ranked first and in the year 1978, 20 papers were published which showed neither increasing nor decreasing order.

Pantelis Kalaitzidakis, Theofanis P. Mamuneas and Thanasis Stengos (2001) conducted a worldwide ranking of academic institutions that produce research in a list of 30 top research journals in economics. Among the principal contributions of the present study is the computation of the ranking of journals for the same period for which we conduct our ranking of institutions. Hence, we do not rely on weights that were computed for research carried in earlier periods. Updating the ranking of journals to agree with the period over which the ranking of universities takes place avoids possible biases that may arise in journal weights that do not take into account the current trends in the economics profession. We have noted a trend worldwide for a more evenly distributed generation of academic research in economics. European
academic institutions are well represented in the group of the top 200 universities in the world and so do universities from Asia and the Far East in particular.

Kannappanavar, B.T.J. (2001) reported results of a bibliometric study of investigation of the author patterns involved in the International Monetary Fund (IMF) literature. Authorship data were collected from research activities of the IMF from January 1991 to December 1998, prepared by the Inter departmental working group of fund policy Advice of the IMF. The total number of entries collected was 1,704 and each item was analyzed and tabulated. The results revealed that the team research is more favorable than the solo research and then degree of collaboration in IMF research ranged from 0.45 to 0.623 during the study period with an n overall average of 0.56.

Parameswaran, M. and Smith a, K.G. (2001) analyzed all the 60 issues of LISA published from January 1994 to 1998 using a specially prepared data sheet. The subject headings listed in LISA were further grouped into 16 classes on the basis of their mutual relations. This helped to analyze the subject wise breakup easily. The data collected manually using the data sheet was compared with the data available from, the CD-ROM. The extent of collaborative authorship was measured using Subramanian’s formula and the results helped the investigators to prove the hypothesis that the research papers by single authors were greater in number than collaborative work as covered by LISA.

Das, A.K and Sen, B.K. (2001) analyzed 1049 citations appended to 34 research articles pertaining to issues nos. 2 to 4 volume 20 of the journal; of Bioscience for the year 2000. The authorship pattern of citations showed that 18.68% papers were single-authored, 52.71% were double and triple authored and the remaining 28.61% were joint contributions of four or more authors. Of the cited articles .53% was Indian and the rest by foreign authors. Author self-citation shared 10.87% and journal self-citations shared 0.57%

Shula, M.C., Saksena,S. and Riswadkar, M.R.(2001) attempted to apply Bradford's Law of Scattering and Loti’s Law of Productivity to bio-energy literature to verify if the law holds good for ten Abstracting services. Results of linear regression showed that Lotka's distribution holds good for bio-energy literature and the value of n ranged between 205 and 4.5.
Thelwall (2001) showed that the counts of in links to a set of 25 UK universities correlated significantly with their average research productivity using the five-yearly UK government Research Assessment Exercise (RAE) of research productivity.

Gooden, A.M. (2001) reported research on "Citation Analysis of Chemistry Doctoral Dissertations: An Ohio State University Case Study" this research states citation analysis of dissertations accepted in the Department of Chemistry at The Ohio State University between 1996-2000 was performed as a way to determine material use. The 30 dissertations studied generated a total of 3,704 citations. Types of materials cited, currency of literature, and dissertation topics were all analyzed. The current results corroborate past research by other authors. Journal articles were cited more frequently than monographs: 85.8% of the citations were journal articles and 8.4% of the citations were monographs. The results of this study may be used to assist OSLJ and other universities in chemistry collection development.

Ivancheva (2001) has an attempted made to give an answer to the question: Why do most Bibliometric and scientometric laws reveal characters of Non-Gaussian distributions, i.e., have unduly long "tails"? Application of the approach of the so-called "Universal Law," discovered by G. Stank (1997, 1998) is implemented. The 37 basic principle used is that of the reciprocity of energy and space. A new "wave concept" of scientific information has been propounded, in which the terms of the well-known Bibliometric and scientometric distributions find a rather satisfactory explanation. One of the made corollaries is that $\alpha = 1$ which is the most reasonable value for the family of Zapf laws, applied to information or social phenomena.

Granovsky (2001) has devoted to the scientometric research of Professor V.V. Nazimova (1910-1997) of Moscow State University. His first scientometric article was published in 1959: mathematical models of world science growth were examined and logical grounds for the applicability of these models were also given. In his further works, V.V. Nazimova continued to stress the importance of quantitative studies of science development. In 1969, the monograph on scientometrics by V. V. Nazimova and his co-author Z. M. Mulchenko was published. One of the latest works by Nalimov was an analysis of articles published by The Journal of Transpersonal 53 Psychology: Here the scientometric approach was used to study the origin and development of a new scientific branch.
Arunachalam and Umarani (2001) carried out macroscopic analysis of agricultural research in India through bibliographic information of papers published in the year 1998. In all they identified 11,855 articles of Indian origin through the scanning of CD-ROM discs of CAB Abstracts of 1998 to early 2000. The authors reported that unlike in Physics, Chemistry, Biology and Mathematics, most of the papers of agricultural research were published in Indian journals. Among the Indian institutions, the contribution of the Jwaharlal Nehru Krishi Vishwavidyalaya, Jabalpur (MP) and the Indira Gandhi Krishi Vishwavidyalaya, Raipur (CG) was 1.20 and 0.80 per cent respectively of the total articles published in the year 1998. Among the Indian states contributing to world literature on agriculture the share of MP was reported to be 4 per cent in the period from 1990 to 1994 and 5.3 per cent during the year 1998. The authors identified the active institutions in the manner of publishing their research and opined that there had been much emphasis in the areas of plants of economic importance and animal sciences as compared to research in biotechnology.

Jacobs (2001) conducted bibliometric study of the publication patterns of a selected group of academic and research scientists of ten universities of South Africa for a period of five years, from 1992 to 96. The subject fields surveyed were Physics, Chemistry, Plant and Animal Sciences, and Microbiology/Biochemistry. The general purpose of the study was to 1) determine whether academic status and prestige had any impact on the level of productivity, 2) study the productivity within different areas of science and 3) investigate whether or not the level of funding and/or the prospects of getting funded had any influence on the level of productivity in each area of science and the pattern of publications. The study collected two sets of data through a scientometric analysis of Science Citation Index and a questionnaire. The universities were noted to vary considerably with respect to standards of education, quantity of research and publications and overall progress. The study demonstrated that there was a direct relationship between status and publication productivity. The study further revealed that there were significant differences in productivity between areas of sciences, but that there was no direct relationship between institutional funding and productivity.

Dutta, B., Das, B. and Sen, B.K. (2002) the study covers 2800 citations appended to 152 articles published in 2001 in eight scholarly journals published by National Institute of Science Communication & Information Resources. In all, 7426
authors are figuring in the citations. On average, there are 18 citations per article and 3 authors per citation. The high percentage of multi-authored citations clearly indicates the dominance of team research in the concerned fields. On average, journal articles account for about 79 percent of the citations. Monographs rank second with a tally of about 12 percent. Indian Journal of Marine Science receives high percentage of journal self-citation compared to others whereas Indian Journal of Chemistry Section B receives high percentage of author self-citation compared to others. Indian citations received by all journals figure only 10% on average

**Udofia, U.I. (2002)** Compares author collaboration in the periodical literature of African Trypanosomiasis. The study was based on the literature abstracted in the 1990-2000 articles of Tropical Diseases Bulletin (TDB) and Tsetse and Trypanosomiasis Quarterly (TTQ) using the counting method. It is found that both the annual rates and the cumulating of author collaboration for the period for each of the ten years was high although the figures obtained for 1992-1995 and 1998-2000 were higher than those for 1990-1991 and 1996-1997. Concludes that though author collaboration exists in African Trypanosomiasis literature for the ten years studied, it is generally high but each year's literature is dominated by multiple authorship, and in all, two and three authored papers were predominant. The extent of collaboration was up to 11 authors per article, and this calls for more collaboration to extend the authorship beyond 11 authors per paper, as it is noted in other scientific disciplines. The study has provided factual information in support of information services in the field of African Trypanosomiasis literature

**Kaur, Amritpal (2002)** the author explains, ILA: bulletin published by the Indian Association has played key role in the dissemination of fundamental and applied knowledge of library and information science. The paper brings out the result of the bibliometric study covered in the issues of ILA bulletin during 1996-2000. It examines authorship pattern and the year wise, statewide, Institute wise and subject wise distribution of contribution. It and year 1844. Citation appended to 59 research articles. It gives average number of citation contribution and type of publication cited and presents a ranked list of cited journals.

**Kaur (2002)** explored the Malaysian Journal of Library & Information Science for a five year period from 1996 to 2000. In this study, the authors came up with the findings that, the average number of references per article was 22.5 and the
average length was 41.2 pages which were purely tentative. The most popular subject was scientific and professional publishing. Most of the contributions were from Malaysian academics and single-authored articles were found from the governing places.

**Spink, (2002)** at the same time, the recent improvement in ICT has made international publication potentially more efficient and feasible. He and Spink (2002) suggested that the growth of collaborative research and flow of information over the Web have contributed to the increasing level of globalization in publications across disciplines. While recent technological developments favour improving international communication, scholars in the digital divide underscored that such development alone would not automatically bring about a more even information flow

**Smith and Thelwall (2002)** studied the WIF for the Australian Universities' websites. Counts of links into the websites of Australasian universities were calculated from the output of a specially designed crawler that covered universities in the UK, Australia and New Zealand. These figures were compared to those from the commercial search engines such as AltaVista and AllTheWeb. WIFs for Australasian universities were then calculated by dividing link counts from the three countries by academic staff numbers at each target university.

**Smith and Thelwall (2002)** concluded that AltaVista and AllTheWeb search engines could find more domains and links compared to other Internet search engines and they are also more accessible and easier to use. The world universities are ranked based on their academic and research performance every year by some reputable centers such as the Institute of Higher Education, Shanghai Jiao Tong University (IHE-SJTU). The result of this ranking, published annually as Academic Ranking of World Universities (ARWU), is of international importance.

**Monique Gome (2002)** Analyzed references cited in the articles published by authors, kinds of publications and which journals are mainly used. He also studied the ages of the cited journals and their cost-effectiveness. Author compared two sets of data: articles published over the period 1991-3 as pre-WWW period and from 1997-9 as WWW period. 6,351(205 articles) and 12,937 (459 articles) cited references were obtained during 1991-3 and 1997-9. The average of cited references per article is 33 and 32 respectively. Articles were published in 27 46 Different journals. More than
70% were published in the core astronomical journals; Most of the journals cited are less than 10 years old. The cost-effectiveness of astronomical journals is high whereas that of the physics journals is very low.

Tiew, W.S. Abrizah, Abdullah and Kiran, Kaur (2002) had a bibliometric examination of all the journal articles published in the Malaysian Journal of Library and Information Science from 1996-2000. The range of articles published per volume is between 14 and 17, average number of references per article is 22.5; the average length per article is 41.2 pages, 69. 74% of the articles are research oriented,' the percentage of multi-authored papers is slightly higher at 52.6%. The most prolific author contributed 12 articles, 45% of the authors are geographically affiliated to Malaysia,' the most productive institution is Faculty of Computer Science and Information Technology, 39.5% articles contained author's self-citation, while the rate of journal. Self-citation is found to be 27.6% and most of the articles 67.1% contained no formal acknowledgement.

Macias-Chapula, C.A and Mijangos-Nolasco, A. (2002) had a bibliometric study on AIDS literature from 1980-2000. Seven countries and 1052 records were identified. Main participating countries were Democratic Republic of the Congo and Cameron. Results indicated a high pattern of collaboration through multiple authors. Most documents were published in English and French. Over 57percent corresponded to journal articles.

Udofia, UI. (2002) Compares author collaboration in the periodical literature of African Trypanosomiasis. The study was based on the literature abstracted in the 1990-2000 articles of Tropical Diseases Bulletin (TDB) and Tsetse and Trypanosomiasis Quarterly (TTQ) using the counting method. It is 48 found that both the annual rates and the cumulating of author collaboration for the period for each of the ten years was high although the figures obtained for 1992-1995 and 1998-2000 were higher than those for 1990-1991 and 1996-1997. Concludes that though author collaboration exists in African Trypanosomiasis literature for the ten years studied, it is generally high but each year's literature is dominated by multiple authorship, and in all, two and three authored papers were predominant. The extent of collaboration was up to 11 authors per article, and this calls for more collaboration to extend the authorship beyond 11 authors per paper, as it is noted in other scientific disciplines.
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Monique Gomez. (2002) Analyzed references cited in the articles published by authors, kinds of publications and which journals are mainly used. He also studied the ages of the cited journals and their cost-effectiveness. Author compared two sets of data: articles published over the period 1991-3 as pre-WWW period and from 1997-9 as WWW period. 6,351(205 articles) and 12,937 (459 articles) cited references were obtained during 1991-3 and 1997-9. The average of cited references per article is 33 and 32 respectively. Articles were published in 27 different journals. More than 70% were published in the core astronomical journals; Most of the journals cited are less than 10 years old. The cost-effectiveness of astronomical journals is high whereas that of the physics journals is very low.

Uzun (2002) focused on authors from developing countries (DCs) and the former socialist Eastern European Countries (EECs). He examined 21 LIS journals and found that only 7.9% of the articles were by authors from DCs or EECs, Their articles were more often published in less prestigious journals. He and Spink (2002) recognized that scholarship is an increasingly international pursuit; the importance of studying foreign authors was emphasized. They analyzed

Tiew, Abdullah & Kaur (2002), single-authored contribution were found dominant by contributing 79% articles. Liberator, Solana and Guimareas (2007) conducted a bibliometric analysis of the journal 'Ciencia da Informacao'. The results showed that there was less authorship collaboration, while most of the authors' affiliation was from Brazilian universities. The literature published during 1999 to 2005 in the Annals of Library and Information Studies

Chen et al. (2002) have integrated approach to scientometric studies with emphasis to the use of information visualization and animation techniques. This 50 study drawn upon citation and co-citation patterns is derived from articles published in the journal Scientometrics (1981–2001). The modeling and visualization take an evolutionary and historical perspective. The design of the visualization model adapts a virtual landscape metaphor with document co-citation networks as the base map and annual citation rates as the thematic overlay. The growth of citation rates is presented
through an animation sequence of the landscape model. Issues concerning the visual-spatial design are discussed from a citation analysis point of view.

**Garg and Padhi (2002)** have analyzed 952 publications published by Indian scientists and abstracted by Journal of Current Laser Abstracts during 1970-1994 which indicates that laser research in India picked up during 1978-1994 and reached its peak in 1980. The Indian output in the field of laser research forms an integral part of the mainstream science as reflected by the pattern of publications and their citations in the international literature. Laser research performed in India improved considerably during 1985-1994 as compared to 1970-1984 as seen by different impact indicators such as citation per paper, proportion of high quality papers, and publication effective index. India's citation rate per paper for highly productive authors is at par with the world citation rate per paper. The study indicates that the proportion of mega authored papers increased during 1990-1994 and the international collaboration is mainly with the USA.

**Garg (2002)** has analyzed 1223 papers published by India (347 papers) and China (876 papers) at conferences and in journals during 1993 and 1997 in the field of laser S&T indicates that China's output was twice to that of India. However, Activity Indices for both the countries in 1993 and 1997 were almost the same. Chinese scientists preferred to publish in domestic journals, while Indian scientists published in foreign journals. The impact made by Indian papers was more than for Chinese papers, as reflected by normalized impact per paper, proportion of papers in high quality journals, and publication effective index.

**Peritz and Bar-Ilan (2002)** have examined the extent to which the field of bibliometrics and scientometrics makes use of sources outside the field. The research was carried out by examining the references of articles published in Scientometrics in the course of two calendar years, 1990, 2000. The results show that in 2000, 56.9% (and 47.3% in 1990) of the references originated from three fields: scientometrics and bibliometrics; library and information science; and the sociology, history and philosophy of science.

**Uzun (2002)** has surveyed a set of ten scholarly journals that publish the mainstream of papers in the field of Scientometrics, Informetrics, and Bibliometrics 52 (SIB). The survey is limited only to the research articles published in the field for
the two decades period 1981-2000. Each journal was examined issue by issue for the institutional affiliations of contributing authors. Institutional rankings for the total period and the two decade periods; 1981-1990 and 1991-2000 were determined by awarding credit to the authors' institutions based on authorship. In the composite of ten journals, the University Sheffield (England), the University of North Carolina (USA), the University of Leiden (Netherlands), the City University of London (England), the National Institute of Science, Technology and Development Studies (India), the University of Sussex (England), the University of Illinois (USA), the University of Michigan (USA), the Hungarian Academy of Sciences Library (Hungary), and Indiana University (USA) emerged as the ten most productive institutions for the period 1981-2000.

Ramesh and Nagaraja (2002) bibliometrically evaluated the publication pattern in the International Journal of Tropical Agriculture during the period from 1991 to 2000. They recorded the year-wise distribution of papers, the authorship pattern, the extent of collaboration, geographical location of contributors and the types of their affiliation, average length of articles and citations in the papers. They concluded that the author affiliation emphasized the dominance of Indian authors and that the multiple authorship pattern in the articles belonging to academic institutions. They further observed that the articles covered latest research developments in tropical agriculture around the globe.

Vijayakumar and Naqvi (2002) while assessing the authorship trend in Indian literature on Azadirachta indica reported that collaborative research was more favored than the solo research. The number of single authorship articles was 122 (10.98%) as compared to 989 articles of multi authors (89.02%) out of the total number of articles of 1,111.

Raan and Leuwen (2002) presented the results of a study to assess crucial aspects and the strength of the scientific basis of a typically interdisciplinary, applied field: the Nutrition and Food Research. The approach was based on an advanced bibliometric analysis with novel elements to assess the influence and dissemination of research results and to measure interdisciplinary. In order to adjust the contrast with ‘single-disciplinary’ research assessment, the authors represented application-oriented research by an interdisciplinary research profile that with a clear distinction between basic and applied research. Application of the approach to support an international
audit of the Nutrition and Food Research Institute showed that advanced bibliometric analysis allowed assessment beyond conventional academic standards. An important policy-relevant implication, strongly supported by the audit committee, was that realignment of an applied research institute toward a stronger market-orientation should not be at the expense of basic research.

Mela, G., Martinoli, C., Poggi, E. and Derchi L. (2003) evaluate number and scientific weight of papers written by European radiologists during the period 1995-2000 and compared with other countries. Study shows that European Radiological Research is responsible for 40% of the world scientific production and Germany, UK and France are the leading publishers in Europe. European research received a lower impact factor than that from the U.S. European radiology is growing and its production is increasing over time, thus indicating strong commitment to research from European radiologists; however, European radiological research has not yet reached leadership in the literature.

Senthil kumaran, P. and Vadivel, V. (2003) conducted a bibliometric study of the 'Spice India' Journal for the period 1997-2001. Based on the collected data, the year wise distribution of articles, year-wise distribution of citation, authorship pattern, length of articles, subject wise breakup of articles and leading authors were analyzed

Biradar, B. S. and Sampath Kumar, B. T. (2003) the study aims to examine in the light of obsolescence of literature, Annual Ageing Factor (AAF), Mean Life (ML) and Utility Factor (UF) of periodicals in the field of chemistry. This is based on references appended to the articles published in Indian Journal of Chemical Technology during the year 1994, 1997 and 1999. Obsolescence of literature was studied and half-life of literature was found to be 11.8 years. Study also applied Brooke's formula for identifying Annual Ageing Factor (AAF)

Susanta Koley and Sen, B.K (2003) analyzed 457 citations appended to 26 research articles published in the four issues of the quarterly Indian Journal of Physiology and Allied Sciences, vol. 55(2001). Articles are contributed by 75 authors (74 - Indian). From the citation count it appears that the solo research in physiology is quite substantial (about 24%). Though about 77% of the work is the result of team research, the team size is found to be small ranging from 2 to 5. Of the citations, 76.81 percent relate to journal articles, 18.59 to monographs, and the rest to
conference papers, theses, etc. The ratio of Indian to Foreign citations is found to be almost 1:6. Of the total citations, 4.59 percent are author self citations, and 2.84 percent are journal self-citations. Of the citing articles one is single-authored, 10 are two-authored, 9 three-authored, 4 four-authored, and one each five-authored and six-authored. No collaboration was noticed in the case of 23 citing articles. The remaining 3 articles were the results of two-institution collaboration.

Jeevan, V.K.J. (2003) this study analyzed the printed weekly issues of 'Employment News' from the year 1998-2001 to assess the job opportunities in the library and information science profession. The data gathered is presented in 25 tables and analyzed to reflect the major employers - the central/state governments and/or its allied institutions and the private sector; nature of job whether it is permanent, deputation or temporary; reservation trends; state in which the job is advertised; essential (academic as well as professional) and desirable qualifications; prior experience; and the prominent employers and categories of jobs. To a graduate who is looking for a suitable professional outlet, library and information science is thriving as a potential job prospect. This assumption is countered in this paper by making few suggestions regarding what is to be done by all concerned, be it the student, employer, or professional bodies. Though the data used in the study is limited, it reflects the significant trends from a major stream for professional employment, the central government and its autonomous and research institutions. However, more of such studies on data gathered from national and regional newspapers and job portals are required to verify the results of this study and to assess the true picture of employment trends in the discipline.

Satish, S. Munnolli and Kalyane, V L (2003) analyzed 312 papers of Ram Gopal Rastogi published during 1954 to 1992 in various domains: (a) Luni - solar activity and quiet -time E & F - region (57); (b) Equatorial electric field and low and mid latitude ionosphere (78); (c) Ionospheric E - region irregularities (19); (d) Ionospheric F - region irregularities (32); and (e) Magnetic disturbance effects on the equatorial low and mid latitude ionosphere (23) were analyzed. Inter-domainery contents and of the number of papers: a+b were 36; b+c and b+d were 20 each; b+e were 16; c+e were 5; a+e were 3; d+e were 2; and a+d had only one publication. Highest collaborations were with H. Chandra (61), M. R. Deshpande (42), and G. Sethia (19) out of his total 97 collaborators. His highest productivity was during 1978
with 28 papers followed by 19 papers during 1977. The core journals preferred by him for publishing papers were: Indian Journal of Radio & Space Physics, India, and Journal of Atomic & Terrestrial Physics, UK (59 each), followed by Proceedings of the Indian Academy of Sciences, India (34). Most prolific title keywords with their frequencies were: Ionosphere (92); Equatorial (61); F-region (53); Equatorial electrojet region (40), and Magnetic equator (30).

Pelzer, Nancy L. and Wiese, William H. (2003) A systematic study was done to analyze and characterize the bibliographic citations appearing in twelve-core veterinary journals citation analysis yielded 55,823 citations, of which 3,564 (6.38%) were considered to be grey literature. Four veterinary specialties, internal medicine, pathology, theriogenology, and microbiology, accounted for 70% of the total number of articles. Three small-animal clinical practice journals cited about 2.5-3% grey literature, less than half that of journals with basic research orientations, where results ranged from almost 6% to approximately 10% grey literature. Nearly 90% of the grey literature appeared as conferences, government publications, and corporate organization literature.

Vinkler (2003) revealed the relative indicators are preferably used for comparative evaluation of thematically different sets of journal papers. The Relative Publication Strategy and Relative Subfield Citedness (RPS/RW) function referring to a set of papers selected was found to be identical with the Mean Expected Citation Rate and Mean Observed Citation Rate (MECR/MOCR) function

Koley and Sen (2003) studied 457 citations appended to 26 research articles published in the four issues of the Indian Journal of Physiology and Allied Sciences. The ratio of Indian to foreign citations is found to be almost 1:6 of the total citations, 4.59 per cent are author self-citations and 2.84 per cent are journal self-citations. The citing articles one is single-authored, 10 are two-authored, 9 three-authored, 4 four-authored and one each five-authored and six-authored. No collaboration was noticed in the case of 23 citing articles. The remaining 3 articles were the results of two-institution

Hazarika, Goswami, and Das (2003) opined that, "It is used to identify the pattern of publication, authorship citation and coverage of journal papers in terms of geographic, subject, organization and other related parameters. In their study of authorship patterns, Perianes-Rodriguez, Omelda-Gomez and Moya-Anegon (2010) opined that," Detection and identification of communities with factor analysis is a useful tool for experts in bibliometric and scientometric studies. Likewise the networks obtained are a useful framework for decision making." The result could help in library resource management and planning strategies for documentation service to the user community of that particular literary discipline. Similarly, Glover and Bowen (2004)

Falk (2004) studied that 1200 open access journals were available on the Web as compared to a total of only five in 1992. Deals between publishers can be one of the catalytic forces in the increase of open access journals. Development of open access journal publishing has also been researched by Laakso, Welling, Bukvova, Nyman, Bjork & Hedlund, 2011). A steady rate of increase of the open access journals has also been witnessed by number of authorities. Many carry on studies were also conducted to trace the growth and development of open access journals (Wells, 1999; Crawford, 2002; Gustaffson 2002 (as cited in Laakso, Welling, Bukvova, Nyman, Bjork & Hedlund, 2011; Morris, 2006; Dramatic Growth of Open, 2007; Gul, Wani & Majeed, 2008; Ware & Mabe, 2009) A study by McVeigh (2004) documents that the number of open access journals in the citation indexes provided by ISI Thomson™ is growing, both in terms of creating new titles and conversion of established titles. Open access journal publishing in different fields is also studied by Borgman (2007). The open access platform provided by publishers has also been studied by Dallmeier-Tiessen, et al, (2010). Recent studies have explored a dramatic growth of open access journals (Happy, 2012..., 2011; roven9al, 2011; the challenges of success.2011; Illustrations of the global., 2012).

Bibliometrics studies. It could be observed that there are various research studies highlighting the importance of bibliometric analysis and their applications to library management and administration. This type of analysis enables the researcher to identify the research gap in the previous studies. Review of related studies further avoids the duplication work that has already been done in that area. It also helps the
researcher to study the different aspects of the problem. It enables the researcher to identify the unexplored areas, in order to create new grounds for research...

**Bharvi, Garg and Bali (2003)** have analysed 1317 papers published in first fifty volumes during 1978 to 2001 of the international journal Scientometrics indicates the heterogeneity of the field with emphasis on scientometric assessment. The study indicates that the US share of papers is constantly on the decline while that of the Netherlands, India, France and Japan is on the rise. The research output is highly scattered as indicated by the average number of papers per institution. The scientometric output is dominated by the single authored papers; however, multi-authored papers are gaining momentum. Similar pattern has been observed for domestic and international collaboration.

**Pelzer and Wiese (2003)** conducted a systematic study to analyze and characterize the bibliographic citations appearing in twelve core veterinary journals. Citations from 2,159 articles published in the journals in the year 2000 were analyzed to determine the extent of citations from grey literature. Those citations were further analyzed and categorized according to the type of publication. The analysis yielded 55,823 citations, of which 3,564 (6.38%) were of grey literature. Four veterinary specialties, Internal Medicine, Pathology, Theriogenology, and Microbiology, accounted for 70 per cent of the total number of articles. Three small-animal clinical practice journals cited about 2.5 to 3 per cent grey literature less than half that of the journals with basic research orientation.

**Nalini (2003)** screened 533 citations from 31 articles on occupational health related problems in India published in Indian and foreign journals during the year 2000. It was observed that the papers were contributed from both by academic and research institutions. The number of publications on health consequences of chemical and textile workers topped the list with respiratory problems being the predominant area of study. The Indian Journal of Occupational and Environmental Medicine were found to be the most preferred journal for publishing occupational or environmental health problems.

**Krishna, K.M and Kumar, S. (2004)** analyzed citations of 68 doctoral theses on Agriculture and Veterinary Sciences during 1996 to 2000. The subject wise authorship pattern and trend graph for books and journals were observed. 55 Joint
authors had contributed 61%, single 37% and corporate authors 2% of the total citation,

_Senthil ku in a ran, P. and Vadivel, V. (2004)_ analyzed the journal 'Journal of Spices and Aromatic Crops' for the period 1992-2000. Based on collected data, the study examined the year wise distribution of articles, authorship pattern, length of articles, subject wise breakup of articles, and leading authors. Results on subject wise distribution of articles revealed that the maximum number of articles was related to cardamom 24.35%, pepper and ginger occupied the second and the third position shared 14.50% and 13.98% respectively. The data on contribution of research articles by the Institutes/ universities revealed that the scientists of Indian Institute f Spices Research, Calicut contributed the highest number of research articles 40.93%.

_Surendra Kumar and Kumar, S. (2004)_ conducted a study on citation and bibliometric analysis for knowing the extent of utility of journals, conference proceedings and other literature. In this study, product metric analysis of contributions of National Research Center for Soybean, Indore, has been carried out for the period 1987 - 2001 in terms of number of research articles produced by its scientists. The study is based on a chronological documentation list prepared for the purpose along with author and subject indexes. Also analyze average number of papers per year, types of documents publishing the papers along with names of the journals, subject and language distribution. Authorship pattern is also 57 studied in this paper.

_Mukhopadhyay (2004)_ studied the WIF for SAARC (South Asian Association for Regional Cooperation) countries as well as the sub domains of academic and research institutions in India. He believed that because of the hierarchical structure of the web, WIF should be calculated in three levels and also believed that well-known search engines such as Alltheweb, AltaVista, and Hotbot can be used for data gathering and calculating WIF in each of the above mentioned levels.

_Kannappanavar B U, Swamy, C. and Vijay Kumar, M. (2004)_ highlights the authorship trend and collaborative research in chemistry in India during 1996-2000. The study found that team research is preferred in the field of chemistry rather than solo research. The degree of collaboration is calculated and found to be 0.76. The
degree of collaboration varies from year to year and is found to be 0.72 to 0.83. Average number of authors per paper has increased from 7.52 to 8.39.

**Ashu Shokeen and Sanjay K Kaushik (2004)** aimed to find out the authorship pattern and citation pattern of articles that appeared in Indian Journal of Plant Physiology. The study covers issue nos. 1 to 4 of volume 7 published between Januarys to December 2002, covering 61 articles published in these issues. Overall 1149 citations featuring 2770 authors have been made during the year. The results indicate that 39% articles published (citing articles) in these issues are three-authored. However, it is found that two-authored citations (cited articles) are more common which single-authored papers follow. The results reveal that journal articles are predominant with 81% of total citations. The ratio of author self citation to total citations is 1:16.65. The ratio of Journal Self Citation to total citation is 1:31.91. The results also highlight that 398 citations are below 10 years old, whereas 358 citations are below 20 years but more than 10 years old. It is clear that a majority of documents cited in these issues were published not more than twenty years ago.

**Steven Glover, W. and Sarah Bowen, L (2004)** examine the bibliometric profile of Tropical Medicine and International Health using the subjects of the articles published and the geographical distribution of the authors during the period 1996-2003. The authors of Europe contribute 564 papers and African-authored papers have been cited.

**Bridar B.S and Tippeswamy, K. (2004)** study was based on 3401 references appended to the 61 M.D. Pediatrician Dissertations. Authors had attempted to determine the average number of references per dissertation, forms of documents, authorship pattern, and obsolescence of literature and percentage of cited periodicals available in the library. Results indicated that periodicals (79.12%) were the highly utilized source. Three authors (25.3%) wrote major percentages of articles. 25.98% and 76.70% cited journals and journal articles respectively.

**Krishna, K.M and Kumar, S. (2004)** analyzed citations of 68 doctoral theses on Agriculture and Veterinary Sciences during 1996 to 2000. The subject wise authorship pattern and trend graph for books and journals were observed. Joint authors had contributed 61%, single 37% and corporate authors 2% of the total citation.
Mohammed Furqan Ullah, Kanwar, S .S. and Pradeep Kumar (2004) observed quantitative analysis of citations has immense value in library management, especially in selection of periodicals for subscription. Periodicals as primary sources of information have more importance in research libraries than other sources of information. The cost of the periodicals is increasing day by day and hence its judicious selection is essential. Citation analysis is a useful tool for the modern libraries in this regard. In present study, an analysis has been made of 20,046 citations mentioned in 777 scientific and technical reports published by National Institute of Hydrology, Roorkee, since its inception i.e., December 1978. The paper gives an account of year-wise break-up of different categories of reports. Different bibliographic forms of literature cited in the reports such as journals, books, conference proceedings, technical reports, IAHS publications and other documents like Ph.D. Thesis, M.E./Match dissertation, bulletins, standards etc. have been analyzed and presented. A ranked list of 56 most important journals related with hydrology and water resources, out of 140 cited journals in the reports has been prepared. This ranked list of journals covers 92.7% of the total journal citations. The analysis have revealed that 40% of total journal citations relate to only 3 journals namely Water Resources Research (19.01%), Journal of Hydrology (13.43%) and ASCE's Journal of Hydraulic Engineering (7.56%). The country-wise distribution of most cited journal has also been prepared and categorized.

Rao, M.K.D. and Gupta, B.M. (2004) analyzed the Indo-German collaboration in S&T, through the co-authored publications during the period 1996-2000. The collaboration is under two broad streams, bilateral and multilateral. The study provides an analysis of co-authored papers by main fields and sub-fields and the impact of such collaboration in different fields of S&T. The paper identifies the major institutions involved in collaborative research in the two countries. The study reveals the extent of commonality of subject interest between the two countries. The analysis showed that the bilateral papers were maximum in physics followed by chemistry, biomedical research, etc. However the impact factor of bilateral papers was highest in biomedical research followed by physics, chemistry, etc. As many as 88 percent of all bilateral papers have been reported in journals having impact factor less than 1.38, the average impact factor of all bilateral papers. Similar result of analysis is shown for the multilateral papers.
Mahapatra, R.K and Jyotshna Sahoo (2004) carried out a research programmes at the Ph.D. level in Library and Information Science during the period 1997-2003 to find out the trends and areas of research, growth pattern and productivity of universities along with broad and narrow subject areas in the discipline. It presents the analysis of the study with the primary goal of appraising the perspective LIS research community to make them aware of the direction of research

Narang, Asha (2004) analyzed 8396 citations appended to 737 articles published in the Indian Journal of Pure and Applied Mathematics, during the year 1998-2002 and 470 citations appended to 70m articles published in the maiden volume I Published in 1970 had been carried out to observe the distribution of contributions, authorship pattern, citation analysis, geographical distribution of contributions and the number of pages used in each volume. The average citations per contribution in vol. I was 7 whereas it was 12 in the five volumes. There was clear predominance of single authored contributions in Vol-I (92.86%) as compared to those in the five volumes (35.14%)

Protap Chandra Roy (2004) conducted a study based on 1637 research papers in Library and Information Science (LIS) published in 10 Indian LIS journals during 1991 to 2000. The single authorship was much in vogue in LIS research work in India. Collaborative work was not very popular among the Library Information Scientists.

Praseeda K R and Vasudevan TM (2004) the author describes in their paper about the articles of journals. The university news was analyzed to find out the authorships pattern, subject wise break up and the most prolific contribution. The citation was also analyzed book is most favored among citation which is followed by periodical articles and research reports.

Narnag (2004) analysed comparative study of articles published in Indian Journal of Pure & Applied Mathematics. The results indicate that the number of contributions is increasing in successive volumes. The study analyzed the distribution of contributions, authorship pattern, citation analysis, geographical distribution of contributions and number of pages in each volume.

Uzun (2004) also identified an increase in the share of papers contributed by foreign authors in JASIST, JDoc, Journal of Information Science (JIS), and
Information Processing & Management (IP&M). In terms of articles from Asian nations, Mukherjee (2010) analyzed publications indexed in SSCI that were published by scholars in Asian countries between 2001 to 2007. The study frame included the top 100 subjects from each Asian country that were also included in the Library and Information Science (L&IS)

Ullah, Mohd. (2004) carried out a research on "A quantitative analysis of citations of research reports published by National Institute of Hydrology, Roorkee". Quantitative analysis of citations has immense value in library management, especially in selection of periodicals for subscription. Periodicals as primary sources of formation have more importance in research libraries than other sources of information. The cost of the periodicals is increasing day by clay and hence its judicious selection is essential. Citation analysis is useful tool for the modern libraries in this regard. In this study an analysis has been made of implications of collection of reference materials to project and article referencing, instruction in classes and outreach.

Debaser and Glanzel, 2004 provided a brief overview of the use of bibliometric indicators to support R&D funding. They further mention, "Bibliometrics can be used to develop and to provide tools to be applied to research evaluation but is not designed to evaluate research results. Moreover, bibliometrics does not aim at replacing qualitative methods by quantitative approaches. Consequently, bibliometrics is not designed to correct or even substitute peer reviews or evaluation by experts. Hence, qualitative and quantitative methods in science studies should complement each other. Bibliometric data are by no means exclusively used for science 20,046 citations mentioned in 777 scientific and technical reports published by National Institute of Hydrology, Roorkee. Different bibliographic forms of literature cited in the reports such as journals, books, conference proceedings, technical reports, etc. have been analyzed and presented. A ranked list of 56 most important journals related with hydrology and water resources, out of 140 cited journals in the reports has been prepared. This ranked list of journals covers 92.7% of the total journal citations. The analysis have revealed that 40% of total journal citations relate to only 3 journals namely Water Resources Research (15.01%), Journal of Hydrology (13.43%) and ASCE's Journal of Hydraulic Engineering (7.56%). The country-wise distribution of most cited journal has also been prepared and categorized.
Study. Attempts to analyze quantitatively 475 papers published by the Bio-Organic Division of Bhabha Atomic Research Centre during 1972-2002 in various domains like Synthesis (202), Bioorganic Chemistry (100), Biotechnology (70), Natural Products (53), Waste Management (30), Supra-molecular Chemistry (18) and Organic Spectroscopy (2). The highest number of publications in a year was 38 in 2001. The average number of publications per year was 15.3 and the highest collaboration coefficient 1.0 was found in the years 1972, 1976-1977, 1980-1985, 1987, 1989-1990 and 1993. The most prolific authors were: A. Banerji (125), V. R.

Uzun (2004) reported the findings from a study of patterns of foreign authorship of articles, and international composition of journal editorial boards in five leading journals in the field of information science, and scientometrics. The study covered an American journal and four European journals. Bibliographic data about foreign authors and their national affiliation from five selected years of publication were analyzed for all journals. The foreign inputs of articles were 49 extremely high in Information Processing & Management, and Scientometrics, and were relatively low in the other three journals. The numbers of foreign countries contributing in all journals have increased rapidly since 1996. Canada, England, Belgium, Netherlands, China, and Spain were the countries with high contributions in JASIST. The authors from the USA have dominated the foreign-authored articles in all European journals. A simple linear regression analysis showed that 60% of variation in the proportion of foreign-authored articles in the set of five journals over the selected years could be explained by the percentage of foreign members on the editorial boards of the journals.

Krishnan and Kumar (2004) from a case study of citation analysis of 68 doctoral theses on agriculture and veterinary sciences submitted to Rajasthan Agricultural University, Bikaner during the years 1996 to 2000 observed that the contributions of joint, single and corporate authors citations were of 61, 37 and 2 per cent, respectively. Among the citations of joint authors, the contribution from two, three, more than three and corporate authors was 33, 17, 11 and 2 per cent, respectively.

Mahapatra and Panda (2004) carried out bibliometric analysis of 118 research papers on health literature from Orissa in 50 Indian and foreign journals. The authors observed that research on malaria was the most popular area of health science
research, where the researchers preferred to publish their findings in clinical journals of Indian origin. The Journal of Communicable Diseases and the Indian Journal of Malaria were ranked highest position in publishing papers on health literature of Orissa.

Senthilkumaran and Vadivel (2004) studied the bibliometrics of the Journal of Spices and Aromatic Crops for the period from 1992 to 2000. Based on the total of 193 publications those authored by single, two, three and more than three authors were found to be 11.91, 32.12, 32.12 and 23.46 per cent, respectively. The collaborated publications during period noted to vary from 4.35 to 24.00 per cent for single author, 5.55 to 47.06 per cent for two authors, 11.76 to 50.00 per cent for three authors and 13.04 to 41.18 per cent for multiple authors, where the degree of collaboration varied from 0.05 to 0.5. Among the 193 articles they recorded 8.80, 19.60, 24.84, 15.54, 18.65 and 12.43 per cent articles for nil, 1 to 3, 4 to 6, 7 to 9, 10 to 15 and more than 15 citations respectively. The highest number of articles was of 4 to 6 pages (40.94%), followed by 1 to 3 pages (36.78%), 7 to 9 pages (13.99%), 10 to 15 pages (4.66%) and more than 15 pages (3.63%). Only two articles were found contributed by the foreign authors. The most prolific contributor in the field of research on spices and aromatic crops was also identified.

Rajendiran P, Ramesh Babu B and Gopal Krishan S. (2005). The owner explains the objective of the study is to analysis the global output of fibreoptics research. Articles covered in the Eitch index database covering the period 1999-2003 have been considered for the study. Grow the literature yearwise, country wise, authorship pattern, bibliographic forms, ranking of core journals and nature of research have been analyzed.

Mode (2005) examined the differences in the structure of written communication system of different field of scholarships and analyzed the journal coverage oflISFs databases and identifies why raw data from the databases cannot be used straightway in citation analysis.

Tilak Hazarika. (2005) observed citation pattern of research papers published during 2000 to 2002 in the Indian Journal of Forestry is studied. Of the total 3798 citations appended to 252 research papers, the highest of 60% citations are from journals followed by that from books and monographs (28%) and from technical
reports (5%). The obsolescence factor of forestry literature is found to be 17-18 years. Forestry literature complies with the Bradford's Law of Scattering. Based on the number of citations received, rank list of forestry journals published from India as well as abroad is prepared.

Rajendran, P. Ramesh Babu, B. and Gopala Krishnan, S. (2005) analyzed the global output of 'Fiber Optics' research. Articles covered in the Ei-Tech Index database covering the period 1999-2003 have been considered for the study. Growth of literature year wise, country wise, authorship pattern, 62 Bibliographic forms, ranking of core journals and nature of research has been analyzed. The year 2001 had recorded highest number of articles 1761 (21.2%) followed by 1731 (20.9%) in 2002. The lowest number of articles 1548 (18.6%) was in 2003. In the core journal analysis 581 papers (17.69%) had been published in 'Journal of Light Wave Technology', 483 (13.33%) in 'Optics Communication' and 303 (9.22%) in 'Electronics Letters'.

Kademani, B.S (2005) analyzed 475 papers published by the Bio-organic Division of Bhaba Atomic Research Center during 1972-2002. The highest numbers of publications per year was 38 in 2001. The average number of publications per year was 5.3. The most prolific authors was: A. Banerji V.R.Mamdapur and S.Chattopadhay. The core journals preferred by the scientists to publish their papers include: Indian Journal of Chemistry-B, Tetrahedron letters, Synthetic Communications and Journal of Organic Chemistry.


Monawwer Kqbal. (2005) Observed in year wise distribution of items that the highest number of documents was produced in the year 1992 with 286 items, i.e. 13.39 % on the subject. The most dominating subject in which literature on Personnel Attitude and Job Satisfaction had been produced was Organizational Behaviour with 823 items i.e. 38.54%. In the analysis of core journals, it was found that 'Journal of Organizational Behaviour' published from USA was most Productive, reporting 214 articles i.e. .10.02% followed by 'Journal of Business Research' published from USA.
with 117 items, i.e. 5.48% and 'Journal of Vocational Behaviour' published from USA with 51 items, i.e. 3.74% respectively.

**Alfonso L. Pahner, Albert Sese and Juan Jose Montano. (2005)** Aim of this study is to carry out a bibliometric analysis of the use of statistical methods in tourism research. To accomplish this, a group of 12 tourism journals published within a 5-year period (1998-2002) were chosen and 1,790 articles were reviewed by means of taxonomy with 24 statistical categories. The main results show the percentage of articles that apply statistical techniques as compared to those that do not, and a ranking of the techniques most often used and their distribution according to journal.

**Vijay, K.R. (2005)** revealed that collaborative research was preferred to solo research in the area of food science in India and the degree of collaboration was to be 0.91. The average number of authors per paper also showed an upward trend from 4.89 in 1994 to 8.2 in 2003. The publication pattern from different institutions had studied.

**Anil kumar Dhinam and Yashoda Rani. (2005)** analyzed five-year issues of the Journal of Indian Botanical Society. As it was an Indian Publication, obviously Indians preferred to write for this Journal yet one article reported to come from Utah. On an average, around 17 references appeared per paper and the average length of the papers conies to 4 pages per article.

**Kalyane, V.L. and Kademani, B.S. (2005)** R.Chidambaram's Publications were analyzed by year, domain, collaboration pattern, channels of communication used, keywords etc. the results indicated that the temporal variation of his productivity and of the types of papers published by him was eminently qualified to be taken as a 'role model' for the younger generation to emulate. He had to his credit 17 papers in 'Nuclear Magnetic Resonance', 64 papers in 'Neutron Diffraction and hydrogen bonding', 46 papers in 'High pressure and shock wave Physics', 10 papers in 'Quasicrystal', 27 papers of 'General Interest'. The highest collaboration Coefficient was 1.0 during 1964-67, 1969, 1971, 1973-75, 1977 and 1982. The publication productivity coefficient was 0.66.

**Rajendran, P. Ramesh Babu, B. and Gopalakrishnan, S. (2005)** analyzed the global output of 'Fiber Optics' research. Articles covered in the Ei-Tech Index database covering the period 1999-2003 have been considered for the study. Growth of literature year wise, country wise, authorship pattern, bibliographic forms, ranking
of core journals and nature of research has been analyzed. The year 2001 had recorded highest number of articles 1761 (21.2%) followed by 1731 (20.9%) in 2002. The lowest number of articles 1548 (18.6%) was in 2003. In the core journal analysis 581 papers (17.69%) had been published in 'Journal of Light Wave Technology', 483 (13.33%) in 'Optics Communication' and 303 (9.22%) in 'Electronics Letters'.

Kademani, B.S. (2005) carried out a research on "Scientometric Dimensions of Innovation Communication Productivity of the Chemistry Division at Bhabha Atomic Research Centre" This study express Scientometric analysis of 1733 papers published by the teams comprising total of 926 participating scientists at Chemistry Division of Bhabha Atomic Research Centre (BARC) during 1970-1999 in the domains: Radiation & Photochemistry and Chemical Dynamics (649), Solid State Studies (558), Inorganic, Structural and Materials Chemistry (460) and Theoretical Chemistry (66) were analyzed for year wise productivity, authorship pattern and collaboration. The highest number of publications!!! A year was 98 and 104 produced in 1989 and 1996 respectively. Average number of publications per year was 57.76; highest collaboration coefficient 1.0 was in 1977 and 1999. The authors with most prolific publications were J. P. Mittal (204), R. M. Iyer (190), J. V. Yakhmi (156), V. K. Jain (106). The core journals preferred for publishing with high number of publications were: Indian Journal of chemistry - A (96), Radiation Physics and Chemistry (92), Chemical Physics Letters (67). Publication concentration was (28.57%) and publication density was (5.48). Top ranking journals publishing chemistry division, BARC publications were from UK (471), India (326), The Netherlands (302), USA (277) and Switzerland (104).

LaBonte, K.B. (2005) carried out a research on "Citation Analysis: A Method for Collection Development for a Rapidly Developing Field" this research states that Citation analysis was used to determine if the Sciences-Engineering Library at the University of California at Santa Barbara is meeting the needs of an interdisciplinary group of 60 faculty members at the new CaliforniaNanoSystems Institute. The latest three publications of each faculty member (published within the last two years) were analyzed in two ways using the Science Citation Index: 1) the journals they were
published in, and 2) the journals where cited articles were published. The results indicate that the library subscribes to 98 percent of the journals in which faculty members are published or are citing frequently. This information is useful to map the citation patterns of a new interdisciplinary field and can be used for future collection management decisions.

McKiernan (2005) has described the bibliometrics as traditionally associated with the quantitative measure of documentary materials and embraces all studies which seek to quantify the process of written communication. These include 48 science studies, research evaluation, knowledge management, environmental scanning, trend analysis, and the optimization of library and information resources. Significant Web resources relating to bibliometrics and related approaches are now available.

Kumar and Garg (2005) have analyzed 2058 papers published by Chinese authors and 2678 papers published by Indian authors in the field of computer science during 1971-2000 which indicates that India’s output is significantly higher than the Chinese output. However, China is catching up fast. Chinese researchers prefer to publish their research results in domestic journals, while Indian researchers prefer to publish their research results in journals published in the advanced countries of the West. Also the share of papers in journals covered by SCI for India was higher than from China. However, no significant difference has been observed in the impact of the research output of the two countries as seen by different impact indicators. Team research is more common in India as compared to China.

Sarasvathi and Raghavendra (2005) reported bibliometric analysis of cloning based on 3,270 citations downloaded from AGRIS databases for the Period from 1996 to 2002. It was observed that Molecular Biology and Biotechnology covered the subject area to the maximum (42.01 /%), followed by Agriculture (18.05%), Medicine (16.05%), Microbiology (7.06%) and lowest by those of Bacteriology and Virology (5.02%).

Vijay (2005) analyzed the research publication trends among Indian food scientists and technologists from the screening of 5,153 Food Science and Technology Abstracts (FSTA), a product of International Food Information System, during the years from 1994 to 2003. Out of the total abstracts, the number of authors per paper
ranged between 1 and 23, where the maximum (36.941%) were of two authors per paper, followed by three authors per paper (30.568%), four authors per paper (14.979%) and five authors or more per article (0.424 to 5.356%). The degree of collaboration was found to be 0.91 (0.88 to 0.95) through the ten years of the study. The publication productivity was highest for universities (2,110 papers), followed by private institutes (345 papers), Colleges (304 papers), NDRI (167 papers), BARC (136 papers), Central Avian research Institute (129 papers), IARI (113 papers), RR Labs (91 papers) etc.

Kademani et al. (2005) quantitatively analyzed 475 papers published by the Bio-Organic Division of Bhaba Atomic Research Centre during the period from 1972 to 2002. They recorded the total number of publications in different spheres of the research in the Division. The highest number of publications in a year was 38 in 2001. The average number of publications per year was 15.3 and the highest collaborative coefficient 1.0 was found in the years 1972, 1975-1977, 1980-1985, 1987, 1989-1990 and 1993. The frequency of prolific authors ranged between 25 to 125. The authors also identified the core journals preferred by the scientists of the Division.

Kamlesh Goel (2005) analyzed 1,942 Indian papers to know authorship pattern, productivity of Indian institutes, core journals and their impact factor, comparison of academic productivity in India and the globe, scattered papers and chronological research trend in Psychology discipline by using bibliometric techniques. The papers were downloaded from the Psycho. CDROM database and evaluated by using bibliometric techniques. Among the articles joint authorship was prominent with the highest percentage of those by two authors (39.05%), followed by three (18.43%), four (8.05%) and more than four authors (6.12%) as compared to the single author articles (28.00%). Indian universities and colleges were found at the first rank with 42.84 per cent papers and the Indian institute of Management was at the bottom with 1.18 per cent papers. The author observed that the Indian journals did not have any impact factor due to poor coverage of Indian journals by Social Science Citation Index. Out of the 1,942 papers, 1,639 papers were published in the journals which had no impact factor. The author concluded that the top four countries as India, USA, UK and Netherlands published 5.37 per cent journals and 93.24 per cent papers; whereas, the rest of the world published only 6.76 per cent journals with 14.63 per cent papers. The National Institute of Mental Health, Bangalore was at the first rank.
with 313 papers (16%), followed by the Post Graduate Institute of Medical Education and Research, Chandigarh with 67 papers at the second rank and the Banaras Hindu University, Varanasi at the third rank with 66 papers. Finally, the author opined that there was an urgent need of wider coverage of Indian journals by Social Science Citation Index for reliable results in the field of psychology since 73 per cent papers were covered by only 11.24 per cent Indian journals.

Surendra Kumar and Kumar (2005) analyzed 743 research papers comprising 435 main articles and 308 short communications published in Volumes 10 to 18 (1993 to 2001) in the Journal of Oilseeds Research, in comparison to an earlier study covering the volumes 1 to 9 (years 1984 to 1992) comprising 241 main articles and 257 short communications (total 498 papers). The authors observed that the oilseeds research was an area of collaborative research and that the productivity of the journal was increasing year by year.

Noruzi, (2006). A key to webometric studies has been the use of large-scale search engines, such as AltaVista and All the Web that allow measurements to be made of the total number of pages in a web site and the total number of back links to the web site. These search engines provide similar possibilities for the investigation of links between web sites/pages to those provided by the academic journals citation databases by the Institute of Scientific Information (ISI). But the content of the Web is not of the same nature and quality as the databases maintained by the ISI.

Swap an Kumar Patra and Prakash Chand. (2006) Presents a bibliometric study of Library and Information Science research literature emanating from India based on the data abstracted in Library and Information Science Abstracts (LISA). Standard bibliometric techniques are employed to analyze the collected data and accordingly get indicators. Bradford's law of scattering is used to identify core journals of library and information science wherein Indian authors publish their research output. To understand the productivity pattern of authors, Lotka's Law has been applied. The identified core journals are mostly published from India. Indian author's contribution in international journals is very low. A list of authors who have published 10 and more papers during 1967-2004 is drawn and presented. Such authors are 37 (1.35%) in number and authors with single publication have major share (74.63%). The author's productivity pattern is in conformity to Lotka's law.
Rekha Mittal, Arti Sharma and Gian Singh. (2006) analyzed of 536 papers published on Library and Information Science education during the period 1995 to 2004. The productivity of authors and core periodicals has been determined using Lotka's and Bradford's law. Literature growth, country-wise distribution of papers and language pattern has also been studied. Literature growth in this area of LIS has been found to be negative. Most of the papers have been contributed by single authors (72.8%) and two authors (20.69%) and 72% of literature is published in 72 journals.

Mahapatra, K. and Padmanav Jena. (2006) Describes the growth of scientific research literature on Orissa published during 1985-2004. Includes 875 research papers from forty different journals. Analyses the data by their authorship pattern, year wise growth, and subject wise break up of papers, category of journals, place of origin, length of papers, and productivity of journals.

Neena Singh and Dominic, J. (2006) analyzed 687 citations appended to 30 research articles published in four issues of Allelopathy Journal. From the citation count it appeared that solo research in allelopathy was quite substantial only 32.52%. About 64.48% of the research work contribution was the result of the team research. Of the citation count 89.69% relate to journal article, 6.11% to Thesis and 3.79% to conference papers. Indian citations had been found to be more with 65.5 and foreign citation 34.35% of the total citation. The study revealed that 30.57% of the total citation was the author self-citation and 16.16% were journal Self-citation.

Rajendran P. (2006) the author explains, bibliometric analysis of the papers published by Raja Ramanna Center for advanced Technology (RRCA) Scientist and engineers was undertaken for the year 1995-2004. ISI web science was used as main source for this study is to compile a list of all the papers by RRCAT authors and quantitatively count and analyzed by year wise distributed growth trend, document type, subject wise distribution, references appended and length of papers also to identity RRCAT authors journals authorship pattern. The parameters studied and result drawn are presented.

Jena (2006) analyzed the journal "Indian Journal of Fiber and Textile Research" for the period 1996-2004. The trend of publications such as the year wise distribution of articles, bibliographical distribution of citations, authorship pattern,
citation pattern, average length of articles, number of tables and figures used, time lag, geographical distribution of authors and subject analysis have been studied.

**Young (2006)** explored a bibliometric study on Library Quarterly (LQ) covering for a period of 48 years from 1956 to 2004 with 4226 articles. The author found that more than 50 percent of the top thirty contributors had served on the editorial board of LQ and a large majority of authors were either from the University of Chicago (doctoral graduates or faculty or both). The study found a correlation between the most highly cited authors within LQ corpus and these authors' citations on the Web of Science. The study also found that LQ continues to receive contributions from nearly one-half of the world's most cited LIS scientists, which infer that the journal is reputable and impactful. Young mentioned several bibliometric measures that could be used in future assessment of LQ such as journal attraction power (the proportion of articles written by authors outside the country), author associatively (collaborative authorship) and consumption index (popularity and citation factors of the journal from both its own and other scholarly journals.

**Singh, Mittal and Ahmad (2006)** conducted a bibliometric study of literature on digital libraries. The important findings are that most articles (61 percent) are single authored; author productivity is not in agreement with Lotka's Law, except in one case where the number of articles is three; the maximum number of articles were published in 2003 with English being the most productive language; maximum articles were published in the journal D-lib Magazine; distribution of articles nearly follows Bradford's Law; and USA ranked first for maximum number of journals.

**Tiew (2006)** bibliometrically studied the LIS journal Sekitar Perpustakaan. The period covered was from 1994 to 2003. Middle-level professionals had major contribution of papers in the journal and like the study of were analyzed by Verma, Tamrakar and Sharma (2007). They noted that maximum numbers of articles (17.56%) were published in year 2005. Single author contribution was the highest with a ratio of 35.88%. Majority of the contributors were Indian academics. Most of the publications (51.15%) Sam (2008) studied the Ghana Library Journal from 2000 to 2006. The majority of items cited were journals with 44.5%, followed by books with 32.5%. Current sources of information were about 62.9% of the journals and 48.8% of the books appeared in the reference lists and were published in 1990 or
later. The subject area most researched was academic libraries. Majority of the authors were affiliated with universities and were local.

Gregor B. E. Jemec and Hanne Nyack (2006) conducted a study of dermatology in Central Europe during the period 1991-2002. The study was conducted in two parts: First the annualized national output for the period 1991-2002 was identified for each country by Medline searches. In the second part of the study a sample was drawn from the papers identified in the first part and the number of citations for each paper noted. Results indicated that the annualized national output showed great variation between countries and from year to year. The mean citation rates were found to vary between 0-5 citations/year, and some underlying publications were 10 years old. Countries with national indexed journals appear to hold a bibliometric advantage over countries without indexed journals. This study was undertaken in order to describe the progress in dermatology made in recent years.

Science Abstracts (LISA). Standard bibliometric techniques are employed to analyze the collected data and accordingly get indicators. Bradford's law of scattering is used to identify core journals of library and information science wherein Indian authors publish their research output. To understand the productivity pattern of authors, Lotka's Law has been applied. The identified core journals are mostly published from India. Indian author's contribution in international journals is very low. A list of authors who have published 10 and more papers during 1967-2004 is drawn and presented. Such authors are 37 (1.35%) in number and authors with single publication have major share (74.63%). The author's productivity pattern is in conformity to Lotka's law.

Mallikarjun Angadi, MM, Koganuramath, B.S., Kademani, B.D. Kumbar, Suresh Jange. (2006) attempts to analyze the publication productivity of Anthony J. Leggett, the 2003 Nobel Prize winner in physics. His contributions peaked in 1987, 1994, and 1998 with 10 papers each. He had 194 publications during 1964-2004 in domains like Super fluid 3He (65), Foundations of Quantum Mechanics (36), Dissipative Quantum Systems (24), Atomic Alkali Gases (18), and Miscellaneous (51), which were analyzed for authorship pattern with his 70 collaborators. Most active collaborators with Anthony J Leggett were: A. Garg with six papers and A. O. MCaldeira, D. M. Ginsberg, D. J. Vanharlingen, F. Sols, S. Takagi and D. A. Wollman with five papers each. His productivity coefficient was 0.60, which clearly
indicates that his productivity increased after 50-percentile age, the highest degree of collaboration (1) for Anthony J. Leggett was found during 1964, 1971 and 1983. Journals have been the most preferred channel of communication, where as many as 139 papers out of 194 have been published. Publication density was 3.02 and publication concentration was 3.59.

**Neena Singh and Dominic, J. (2006)** analyzed 687 citations appended to 30 research articles published in four issues of Allelopathy Journal. From the citation count it appeared that solo research in allelopathy was quite Substantial only 32.52%. About 64.48% of the research work contribution were the result of 65 the team research. Of the citation count 89.69% relate to journal article, 6.11% to Thesis and 3.79% to conference papers. Indian citations had been found to be more with 65.5 and foreign citation 34.35% of the total citation. The study revealed that 30.57% of the total citation was the author self-citation and 16.16% were journal Self-citation.

**Garg, K.C., Dutt,B- and Suresh Kumar.(2006)** analyzed 2275 papers on malaria research published in journals and indexed by Commonwealth Agricultural Bureaux International (CABI) CD-ROM incorporating Tropical Diseases Bulletin (TDB), and Pub Med Medline (web edition) in 1990 and 2000 indicates that the Science Citation Index (SCI) covered only about 68% of the output indexed by CABI and Pub Med. Malaria research output is highly scattered both in terms of the sub-fields of the journals as well as the publishing country of the journals. The publication activity in Brazil increased significantly during 2000 as compared to 1990. Most of the prolific institutions are located in the developed countries particularly in the UK and the USA. 'Parasite biology' constitutes the highest output (37%) followed by 'epidemiology' (19%) and 'drug resistance and antimalarials' (16%). USA and Australia emphasized different aspects of 'parasite biology'. China and Brazil emphasized different facets of 'epidemiology'. Nigeria and Thailand paid more attention to 'complicated malaria and its adverse effects' and 'drug resistance and antimalarials' 66

**Kamal Lochan Jena. (2006)** viewed the journal "Indian Journal of Fiber and Textile Research" for the period 1996-2004. There were total of 8114 citations distributed among 35 journal issues having 507 articles. The trend of publications such as the year wise articles, bibliographic distribution of citations, authorship pattern, citation pattern, average length of articles and geographical distribution of
authors had been studied. Out of total citations, journals constituted 73.92% whereas books constituted 11.61%. The average length of articles was observed as 6 pages. In the geographic distribution the highest number of contributors was from India with 1167 (85.87%). Rest from foreign authors from 21 countries.

Cheng and Liu (2006) highlighted the top 500 world universities are classified into 21 types according to their disciplinary characteristics using clustering method. The indicators used to represent the disciplinary characteristics of an institution are the proportion of publications in six broader disciplinary areas: Arts/Humanities & Social Sciences, Natural Sciences & Mathematics, Engineering/Technology & Computer Sciences, Life Sciences, Clinical Medicine, and Interdisciplinary & Multidisciplinary Sciences. Institutions have been classified into types of having focus in a disciplinary group, having priority in a disciplinary group, having orientation in a disciplinary group, and balanced. The distribution of different types of institutions with respect to countries and ranks are analyzed. 47

Jucher, Schlögl and Stock (2006) have reviewed the dimensions of the scientometrics of journals with reference to the components that are (1st) journal production (articles, authors), (2nd) journal content,(3rd) journal reception(readers),(4th) formal scholarly communication (references, citations), (5th) journal editing (editorial politics, publication). The journal "BuB - forum fur Bibliotheca und Information "(Bob) is analyzed scientometrically. BuB is the library and information studies journal with the highest circulation in German speaking countries. 4,297 journal articles including 6,803 references from the observation period 1990 to 2003 were taken into consideration. Contrary to what was expected with regard to informetric laws, BuB shows remarkable specific characteristics: There is no single top author, but a homogeneous group of authors dominating the literature production. The references present a very high concentration on the own journal. BuB is like an island, to which only few strange information will be washed ashore. Though men and women each produce exactly 50% of all articles, there are gender-specific differences: male authors produce more literature reviews and long articles, female authors write more short articles and conference reports. The references' half-life is with 2.7 years very low, the half-life of cited monographs is higher than that of cited journal articles.
Garg et al. (2006) carried out scientometric analysis of malaria research based on 2,275 papers published in journals and indexed by the Commonwealth Agricultural Bureaux International (CAB) CD-ROM of the years 1990 and 2000. They observed that malaria research output was highly scattered both in terms of the sub-fields of the journals as well as publishing country of the journals, and most of the malaria research was from the developed countries, particularly in the UK and USA. The malaria research output was found highest for parasite biology (37%), followed by epidemiology (19%) and drug resistance and antimalarials (16%). The countries, USA and Australia gave much emphasis on different aspects of parasite biology, while China and Brazil emphasized facets of epidemiology and Nigeria and Thailand paid more attention to complicated cases of malaria, drug resistance and antimalarials.

Garg et al. (2006) analysed the scientometric profile of Indian science based on the publication data of Science Citation Index (SCI) published by the Institute of Scientific Information, USA (now part of the Thomson Scientific) for the year 1997 (down loaded using SCI-CD ROM) as compared to the manually processed data for the year 1987. Academic institutions (universities and college) were the major contributors to the scientific publications output. The scientific output by the Agricultural Universities and the institutes under the aegis of ICAR was 1.8 and 1.6 per cent respectively, from a total of 11,067 publications from all the major science institutions and agencies (Deemed universities, Medical Institutions, ICMR, CSIR, DRDO, DST, DOS, DAE, TIFR etc) during the year 1997, as compared to respective figures of 3.3 and 3.0 per cent of total publications 10,239 during the year 1987. Basing on the value of different impact indicators (normalized impact factor, NIF, publication effective index, PEI and relative quality index, RQI); the TIFR was found to outperform all the other institutions. The authors also concluded that about two-thirds of the total papers of Indian contributors were in low and medium NIF journals.

Garg et al. (2006) studied the scientometric profile of Indian agricultural research through analysis of 16,891 research papers published by Indian scientists during the years 1993 to 2002 and indexed by Science Citation Index Expanded (Web of Science). The authors reported that the publication output in the agricultural sciences was on the decline since 1998 onwards. Dairy and animal sciences followed by veterinary sciences constituted the largest component (49.1%) of the collaborative papers of the Indian agricultural output. Most of the papers were published in
domestic journals (61.5%) and in low normalized impact factor journals with a low rate of citation per paper. They observed that most of the highly productive institutions were either agricultural universities or the institutes under the aegis of ICAR. However, they noted that only a few highly cited authors were from the highly productive institutions.

**Mahapatra and Padmanav Jena (2006)** carried out bibliometric analysis to study scientific research productivity in Orissa state, based on research papers published from 1995 to 2004. They observed that majority of the authors preferred to publish their papers in collaboration with others, it was also noted that research on agricultural science was on higher side as compared to other subjects, nearly 31 per cent of scientific literature was published in non-scientific journals and that more papers were published in Indian journals than in foreign journals.

**Kamal Lochoan Jena (2006)** reported bibliometric analysis of Indian Journal of Fiber and Textile Research published during the years from 1996 to 2004. The increasing trend in the number of contributions in the journal form year to year revealed that the journal was respected as a primary publication by researchers in the area. The author observed that from a total of 507 articles the average citations per article were 16. The predominant citations were from journals (73.92%). In case of authorship pattern three authored papers were found highest (85, 60%) followed by the multiple authorship, indicating collaborative research in the fiber and textile fields. Considering the geographical distribution of the contributors they noted that those from Delhi, Haryana, west Bengal and Maharashtra combined contributed 71.21 per cent of the papers published in the Indian Journal of Fiber and Textile Research.

**Kati Bhatia et al. (2006)** evaluated the research priorities of the National Institute of Occupational Health, Ahmadabad (Gujarat) based on the annual reports of the research projects undertaken at the institute during the 25 years (1975 to 1999). Out of the total of 360 projects completed during the above period, 184 (48.40%) were on epidemiological studies, 75 projects (19.70%) on environmental studies and 121 (31.90%) were on experimental studies.

**Jill Crawley-Low (2006)** observed from the different citations of 22,197 articles in 24 Veterinary journals that the journals citations were the highest (88.8%), followed by books (9.8%) and grey literature (2.1%). Current sources of information
were favored, where 65 per cent of the journals and 77 per cent of the books were published in 1990 or later. Dividing the cited articles into three even zones revealed that 24 journals produced 7,361 cited articles in the first zone. One hundred thirty-nine journals were responsible for 7,414 cited articles in zone 2, and 1,409 journals produced 7,422 cited articles in zone 3. A core collection of veterinary medicine journals would include 49 veterinary medicine journals from zones 1 and 2. The author suggested that the libraries supporting a veterinary curriculum or veterinary research should also include veterinary medical journals from Zone 3, as well as also provide access to journals in non-veterinary subjects such as biochemistry, virology, orthopedics, and surgery and a selection of general science and medical journals.

**Gunasegaram et al. (2006)** reported mapping of chemical sciences research in India from the data collected from the Chemistry Citation Index CD-ROM of 2002. Roughly 4.5 per cent of the global research and development output in chemical sciences was found contributed by the Indians. The papers published by the Indian contributors in US, Indian and UK journals were 26, 21 and 20 per cent, respectively. Among the Indian journals, the Asian Journal of Chemistry took the major chunk of papers, followed by the Journal of Indian Chemical Society and Indian Journal of Chemistry. The Indian Institute of Science, Bangalore ranked first, followed by the Indian Institute of Chemical Technology, Hyderabad, Babe Atomic Research Centre, Mumbai and the National Chemical Laboratory, Pune in contributing to chemical sciences research.

**Biradar (2006)** reported the citation pattern of 370 articles of Indian Journal of Environmental protection (Volumes 14, 19 and 24) published in the years 1994, 1999 and 2004. The total number of references in the three volumes was 4,290, corresponding to 10.65, 11.04 and 13.10 per cent, respectively in the Volumes 14, 19 and 24. Among the different bibliographic forms of literature cited, journals were the highest (56.57%), followed by books (29.81%), Reports (5.06%), Conference Proceedings (4.99%), Theses (2.03%) and the miscellaneous documents such as Standards, Hand Books/Manuals, News Papers, Patents, Encyclopedia, Year Books and Monographs (all the seven collectively 1.54%). The highest number of articles in the three volumes was two authors (38.92%), followed by those of three authors (25.95%), single author (15.01%), four authors (9.73%) and least by more than four (9.19%). The authors also reported the degree of author collaboration and productivity
of universities, colleges, research institutes, government departments and others in contributing to the articles on environmental protection.

Ezhilrani et al. (2006) conducted an investigation on the authorship pattern in Aquaculture Journals, based on the data collected from Aquatic Sciences and Fisheries Abstracts Part I (ASFA I) for a period of 3 years i.e. 1991, 1996 and 2001. In all the years, multiple authored contributions were found more than that of single authors in all broad areas of aquaculture as the values of contributions of multiple authors ranged from 57.1% to 90.8% in different aspects of Aquaculture. The degree of collaboration was found to be 0.85 for all the three years and it ranged from 0.83 (1991) to 0.86 (1996 and 2001).

Jiancheng Guan and Nan Ma. (2007) compared the scientific research in the semiconductor-related field in China with some other major nations in Asia. It is based on the bibliometric information from SCI-Expanded database during the time period of 1995-2004. We show that China has been developing fast in semiconductor research, and become the second productive country in Asia as reflected by the publication profile. The evidences indicate a significant increasing trend in the research efforts and readership among Asian countries. Similar to the scientists in Japan and South Korea, Chinese scientists were more inclined to work in larger groups, typically 4 or more authors. The assessment of research quality is further conducted based on citation-based measures.

Bansard, J, Y.et al (2007) analyzed the bioinformatics and medical informatics literature with the objective to identify upcoming trends that are shared among both research fields to derive benefits from potential collaborative initiatives for their future. The study points out the 68 Francisco Fernandez-Izquierdo, et al (2007) 87 evaluates the historians' work, with a selection of 1,282 source papers published on early Modern History in Spain during 2000 and 2001 (417 articles published in 15 journals, and 865 conference papers included in 14 different proceedings, see references). They contained 44,471 bibliographic references citations (with a repetition factor of 1.59) plus 19,269 references to archive documents or manuscripts. Some conclusions are obtained in a first approach: Although conference proceedings accounted for a larger number of papers (2/3 of total) than journals (1/3), coming from a similar number of
chosen proceedings and journals (14 - 15), the proceedings were not cited more frequently (5.54%) than journal articles (18.53%). Historians work usually alone, their cites are 61.5% monographs and historical materials reached 15.59% of all citations. The vernacular languages, Spanish and Catalanian, together represented 72.50% of the 69 citations, followed by French; other languages were more indicative of the subjects studied. The average age of the citations was fairly high, with the 50th percentile being around 16-17 years. Although a core of 111 journals was identified, dispersal was very wide, for the 7,805 articles cited appeared in 2,132 periodicals, 1,301 of which published only one of the cited articles.

Cosanici, Dragomir. (2007) conducted a comparative study of the citation practices of the state supreme courts in the common law jurisdictions of Indiana, Kentucky, Michigan and Ohio, USA during a recent ten-year span (1994-2004). It focuses on the type of legal materials most frequently cited as authority, examining the importance of both primary and secondary sources. It specifically analyzes the growing usage of electronic citations by the four supreme courts.

Hansard, J. Y. et al (2007) analyzed the bioinformatics and medical informatics literature with the objective to identify upcoming trends that are shared among both research fields to derive benefits from potential collaborative initiatives for their future. The study points out the following. 1) Genetics and proteomics are still not embedded in the medical field. 2) The aspects of MI focused on hospital information and patient management are far from BI topics. 3) BI and MI overlap in using the same computer science and mathematical methods and techniques. This overlap should lead to bridging between biology and medicine.

Francisco Fernandez-Izquierdo, et al (2007) evaluates the historians' work, with a selection of 1,282 source papers published on early Modern History in Spain during 2000 and 2001 (417 articles published in 15 journals, and 865 conference papers included in 14 different proceedings, see references). They contained 44,471 bibliographic references citations (with a repetition factor of 1.59) plus 19,269 references to archive documents or manuscripts. Some conclusions are obtained in a first approach: Although conference proceedings accounted for a larger number of papers (2/3 of total) than journals (1/3), coming from a similar number of chosen proceedings and journals the proceedings were not cited more frequently (5.54%) than journal articles (18.53%). Historians work usually alone, their cites are 61.5%
monographs and historical materials reached 15.59% of all citations. The vernacular languages, Spanish and Catalan, together represented 72.50% of the citations, followed by French; other languages were more indicative of the subjects studied. The average age of the citations was fairly high, with the 50th percentile being around 16-17 years. Although a core of 111 journals was identified, dispersal was very wide, for the 7,805 articles cited appeared in 2,132 periodicals, 1,301 of which published only one of the cited articles.

Vasudevan TM and Suresh P. (2007) The author explains, the descriptive catalogues of the manuscripts collection in the department of Sanskrit and Malayalam were analyzed. The aim of the study was to find out subject wise break up competition wise break up authorship and anonymous workers, language in which more works have been delivered. Interviews with the users were also conducted to know more about the collection. Manuscripts handling a wide range of topics in Sanskrit literature in Sanskrit language are present in the collection did not give any information about the period it recording more than 50% of the manuscripts are completes works with known authorship and unknown authorship in the collection are almost equal in number.

Vera, Tamara and Sharma (2007) revealed that majority of the articles in the journal are two-authored and majority of the contributions are from New Delhi. Anya Aintab & Anuar, (2009). Some important studies are mentioned as under: Authorship, gender and institutional affiliation were studied by Pierre and Herubel (1992) in the literature published in Libraries and Culture. The focus of the study was to examine gender of authorship and institutional affiliation. Twenty three years of Libraries and Culture were chosen as target volumes. The findings revealed that men published more than women in library history.

Pillai, Sudsier K. G. (2007) carried out a research on "Journal citations in Physics doctoral dissertations of Indian Institute of Science". Results of a citation study comprising 690 journals containing 11, 412 references collected from 71 doctoral theses awarded by the Indian Institute of Science, Bangalore during 1999-2003. It was observed that journals are the most frequently cited bibliographic form of citations and it amounts 84.67% of the total citations. The journals most preferred by the Physicists in their theses were Physical Review- B with 9.53% citations, followed by Physical Review-A and Astrophysical Journal. Shelf of journals ranges from
Physicists cite only 16 Indian journals and Pram an ad is the top ranked Indian journal. USA is the leading country of journal publication and English is the prime language of journals. Monthly were cited more and Elsevier Science was the leading journal publisher. Half-life of journal citations was found to be 10 years and the mean year of journals was 14.19.

Hinkler, Peter (2007) has indicated that calculating scientometric indexes for individuals, self-citations should be excluded and the effect of the different bibliometric features of the field should be taken into account. Scientometrics cannot offer a simple consistent method for measuring the scientific eminence of individuals. The h-index method introduced by Hirsch was found applicable for evaluating publications of senior scientists with similar publishing features only. The correctness of the indexes used for evaluating journal papers of individuals should be investigated on the individual level also. Some simple methods using the number of citations and journal papers, and the number of citations obtained by the most frequently cited papers are suggested and tested to demonstrate the advantages and disadvantages of indexes.

Sangam, Kiran Savanur and Manjunath (2007) emphasised on Ramaseshan scientific contributions in various journals and some classic papers. In 45 his entire career as a scientist he has collaborated with 47 eminent scientists and students and has published a total of 178 papers during the years 1944–2000. His field of interest has been varied and thus classified into 4 main areas, i.e.: Crystallographic studies, Magneto-optics & Optics, Solid State Physics and Miscellaneous topics. S. Ramaseshan has contributed for the better understanding of various subjects in which he specialized during his years at the Indian Institute of Science, University of Madras and the Raman Research Institute.

Pouris (2007) has reported the findings of a scientometric analysis of nanoscale research in South Africa during the period 2000-2005. The ISI databases were identified as the most appropriate information platform for the objectives of the investigation and were interrogated for the identification of South African authors publishing in the field. The article identifies trends over time, major institutional contributors, journals in which South African authors publish their research, international collaborators and performance in comparison to four comparator countries (India, Brazil, South Korea and Australia). The major findings of the
investigation are as follows: nanoscale research in South Africa is driven by individual researchers interests up to date and it is in its early stages of development; the country's nanoscale research is below what would one expect in light of its overall publication output; the country's nano-research is distributed to a number of Universities with subcritical concentration of researchers. 46

Kademani et al. (2007) attempted to analyse the growth and development of science and technology (S&T) activities in India, as reflected in publication output covered by Science Citation Index (SCI) during 1990-2004. The Indian scientists published a total of 1,82,111 papers in SCI covered journals during the above period. The present study analyses the broad features of Indian S&T by focusing on its publication growth characteristics, language, format and media of communication, research quality, institutional productivity, patterns of research collaboration, and broad and narrow subject areas of interests of Indian institutions and scientists. A broad comparison of India's research output with select countries, particularly with China, has also been made.

Keshava and Kontikal (2007) undertook a bibliometric study of articles published in Indian Economics journals during the period from 1999 to 2004. On the whole, in the five journals out of the total 1,153 articles, 720 (62.44%) appeared as single author articles outnumbering multi-authored articles (37.56%). Of the total articles 1,525 Indian authors published 71.21 per cent Regarding geographical distribution of Indian papers majority of the papers published were form Delhi (268) followed by Maharashtra (151).

Bakri and Willet (2008), covering period from 2001 to 2006 and compared the results with the previous study. The comparison showed that the number of publications increased, statistically significant changes occurred in types of articles, number of references per article and length of the articles also increased. Two-authored articles were greater in number and the major contribution was from Malaysian authors.

Tsay (2008). A citation analysis of the Journal of American Society for Information Science and Technology was conducted The findings revealed that the production rate of JASIST literature doubled and the average number of references per paper increased 2 to 3 times in the period of 25 years, i.e., from its volumes 1985
to 2004. Similarly, Mukherjee (2009) found that single-authored articles were higher in number in the Journal of the American Society for Information Science and Technology. The arithmetic mean of page length of all the articles ranged from 10.58 to 12.12.

**Anil Kumar, et al (2008)** attempted to study the publishing trends, impact factor authorship pattern, and type of articles, institutional collaboration and affiliated institutions of authors of articles published in Pramana - Journal of Physics. The study revealed the four fold growth of literature in physics during the period 1996 to 2004.

**Willet (2008)** found that many of the most cited papers in the Journal of Chemical Information and Modeling describe software packages that play a key role in modern chemoinformatics research.

**Chua and Yang (2008)** analyzed articles in JASIS for the period 1988-1997 and 1998-2007. They found that collaboration, especially that among authors from different institutions has grown. Second,

**Yeoh and Kaur (2008)** analyses the publication output of Research in Higher Education for subject support in collection development in the light of growing interest in diversified domains of research in higher education. Consequently, analysis of 40 issues of publications revealed a diversified usage pattern of bibliographic reference sources by contributing researchers, with a cumulative total of citations being 8,374. A positive trend in research collaboration of contributing authors, and a steady growth in the use of reference sources, periodicals and web documents in the citations signify the trend of scholarly communication of research works in the electronic age. Similar to other disciplines of research findings, journals and books were the most cited source materials for researchers thrash out.

**Taler, Izabella (2008)** the availability of Current LIS open access e-journals; their presence in well and less well known abstracting and indexing source.


**Pauline Mattsson, (2008)** discussed in his article about Bibliometrics as an important tool in research evaluation in following words as "Modern bibliometrics has been largely inspired by Derek de Solla Price and the seminal work was carried out by him in the middle of the last century. In the book "Little Science-Big Science", 

published in 1963, he analyzed research communication and presented a number of quantitative evaluation techniques. DeSolla Price was the first to examine the increasing trend of collaborations among chemistry researchers by using bibliometrics. Since then bibliometrics has developed into a research field in its own right and given rise to a community of specialized experts, so-called bibliometricians. In addition, bibliometrics is used as a methodology in many other fields of science, first and foremost to map the publication pattern in different disciplines. In economics and sociology, the main interest has been for cognitive purposes, that is, studying researchers' publication behaviour. In the last decade bibliometrics has gained increasing importance in science policy and management. It is first and foremost in the domain of research evaluation where it plays a prominent role." He has also mentioned the use of bibliometrics for "Mapping and visualizing research collaboration - a key area for science analysis and bibliometrics. Studying research collaborations has evolved into a major focus of bibliometrics and receives increasing attention from policy-makers and more general users. Modern research is regarded as increasingly complex and specialized, making it impossible for an individual researcher to master all the knowledge and technical skills needed. In a collaboration, different skills complement each other and this complementarity is hoped to stimulate knowledge sharing and the generation of innovation and new ideas, As a result, collaborative research activities do not only enable the pooling and sharing of resources for enhanced efficiency but are also linked to the quality of the research outcome."

Chikate, R. V. (2008) carried out a study on "Citation Analysis of Theses in Library and Information Science Submitted to University of Pune: A Pilot Study". In this study 27 LIS dissertations were analyzed. A total of 6,257 citations were found in all 27 dissertations. Analysis represents different cited sources, rank list of journals in LIS field, author ship pattern etc. and the result was College and Research Libraries is the most cited journal, followed by Scientometrics, nearly three quarters of the journal articles were from LIS journals, 33 from other subject areas.

Nabe, Jonathan (2008) reported in their study of "Dissertation Citations in Organism Biology at Southern Illinois University at Carbondale: Implications for Collection Development" in this study they used 30 theses of Organism Biology and analyzed 4563 citations. This study shows that some science disciplines do rely on
research older than typically assumed, and that in fact, in plant biology and zoology, research journals retain their value for decades. The data indicate that providing access to electronic back files, and maintaining print back volumes, in these disciplines is necessary.

Surulinathi et al. (2008) attempted to analyse quantitatively the growth and development of Knowledge Management Research in India in terms of publication output as reflected in Scopus database. During 1999-2007 a total of 51 papers were 36 published by the Knowledge Management researchers to various domains: Business, Management and Accounting (24), Engineering (18), Social Sciences (7), Computer Science (6), Decision Sciences (6), Multidisciplinary (4), Mathematics (3), Environmental Science (2), Agricultural and Biological Sciences (1), Earth and Planetary Sciences (1), Economics, Econometrics and Finance (1), Materials Science (1). Year-wise growth of publications and input of records to Scopus database by India is analyzed. More than 80 percent of publications were published in journals. The most preferred journals were International Journal of Information Technology and Management (7), Journal of Scientific and Industrial Research (4), Electronic Library (2), Human Systems Management (2), Journal of Knowledge Management (2), International Journal of Technology Management (2), International Conference on Information and Knowledge Management Proceedings (2), Proceedings Frontiers in Education Conference (2), others journals each (1). There were as many as 24 (47.06) papers contributed by single author. There were five authors contributions is zero and more than 5 authors contribution is less than 1(1.96). The publication behavior indicates that the Knowledge management researchers were lowly selective in publishing.

Hou, Kretschmer and Liu (2008) have explained the structure of scientific collaboration networks in scientometrics is investigated at the level of individuals by using bibliographic data of all papers published in the international journal Scientometrics retrieved from the Science Citation Index (SCI) of the years 1978-2004. Combined analysis of social network analysis (SNA), co-occurrence analysis, cluster analysis and frequency analysis of words is explored to reveal: (1) The microstructure of the collaboration network on scientists' aspects of scientometrics; (2) The major collaborative fields of the whole network and of different collaborative
Kademani et al. (2008) attempted to analyze the growth and development of Vacuum research in Nuclear Science and Technology, as reflected in publication output covered by International Nuclear Information System (INIS) database during 2002-2006. A total of 12027 papers were published in the field of vacuum science. United States topped the list with 1936 (16.10%) publications followed by Japan with 1770 (14.70%) publications. The highest number of publications (3276) was published in 2004. The average number of publications published per year was 2405.4. The highest number of publications was in 'Physics of Elementary Particles and Fields' with 2644 (21.98%) publications. The authorship of collaboration trend is towards multi-authored papers. The highly productive institutions were: Japan Atomic Energy Research Institute (Japan) with 366 publications, University of Tokyo (Japan) with 274 publications, Hiroshima University (Japan) with 245 publications, Osaka University Japan (Japan) with 224 publications and Chinese Academy of Science (P-R-China) with 223 publications. The most preferred journals for publication were: Journal of Vacuum Science and Technology-A with 857 papers, Physical Review -D with 765 papers, Journal of High Energy Physics with 500 papers, Thin Solid Films with 311 papers, Journal of Electron Spectroscopy and Related Phenomena with 309 papers, and AIP Conference Proceedings with 308 papers.

Biswa and Enamul Haque (2008) studied the information use pattern of researchers in veterinary science and animal husbandry based on citations in 18 out of 26 doctoral theses in veterinary science and animal husbandry submitted to the Bangladesh Agricultural University, Mymensingh, Bangladesh during the period from 1990 to 2005. They recorded identical number of citations (1944) in nine theses in each of both the fields. The percentage of citations of journals was highest in veterinary sciences (74.33) and animal husbandry (55) with lowest citation of theses (1.92 and 1.42 % respectively). In both the fields the authors noted one to three Indian journals among the most important journals in all the subjects of veterinary and animal husbandry fields.

Nazim Mohammad and Ahmad Moin (2008), examined the scientific output in the field of 'nanotechnology to offer an overview of research trends in this field and to characterize the growth of literature, authorship pattern, most productive
journals, authors, countries, etc. A total of 2,675 articles for the period of 1991 to 2006 were collected from web of science (WOS), especially via the Science Citation Index. The yearly analysis showed a rapid growth of nanotechnology research from the beginning of 21st century. While applying Bradford’s law of scattering with respect to the identification of core journals, three concentric zones were defined with the ratio of 32:149:639. Which respect to the author productivity through the application of Lotka’s law it was observed that the values obtained were widely different from the real values.

Verma, Neeraj et al (2009) to analyses the authorship pattern, subject-wise analysis of articles, citation pattern and length of articles of contributions published in the Journal of Planter's Chronicle. The study revealed that above 80% of articles contributed by single and double authors combined.

Jeyshankar and Ramesh Babu (2009) conducted a study on Tamil Nadu universities where they examined and explored the websites of 45 universities in Tamil Nadu comprising 27 state and 18 private universities. They found that that some universities in Tamil Nadu have higher number of web pages but their corresponding link pages are very small in number and the websites fall behind in their simple, self link and external link WIF

Zainab, Ani and Anur (2009) in their bibliometric study on Malaysian Journal of Computer Science evaluated the article productivity of the journal from 1985 to 2007 using Lotka's Law. The study further revealed authorship, co-authorship pattern by degree of authors' collaboration that ranged from 0.25 to 0.95.

Levitt and Thelwall (2009) suggested that collaboration was associated with higher citation rate. This is based on longitudinal analysis of data from the SSCI

Anguilla, J.F., Ortega, J.L., Fernandez, M., Utrilla, A.M., (2009) the ranking web of world repositories is introduced. The objective is to promote open access initiative supporting the use of repositories for scientific evaluation purpose L&IS category for every even year during 1976-2004. Given these findings on increasing collaboration and its positive relation with higher citation impact, the next step is to distinguish the different types of collaboration and their effects. The current study aimed to address the dearth of research on LIS international collaboration
patterns. It identified the trends in domestic and international collaboration for the complete sample dataset, and the trends for Asian nations.

Dickinson, Kelly (2009) carried out a research on "Reference Analysis as an Aid in Collection Development: A Study of Master of Architecture Theses at Dalhousie University". This study analyzed references in graduate architecture theses at Dalhousie University written between 2003 and 2006 to determine the format and age of materials used and the most frequently cited items. The study indicated that the average age of materials used was 18 years. It also showed that 65% of the items referenced were monographs, 17% were web-based materials and 10% were serials. This is contrary to other reference analyses, which found that journals are the most frequently used format.

Graham, S. (2009) carried out a research on "Information use in history research: A citation analysis of Master's-level theses at Southern Connecticut State University." This article addresses the need for quantitative investigation into students' use of information resources in the humanities and social sciences. It reports the results of a citation analysis of more than 3,000 citations from 47 history theses submitted between 1998 and 2008 at a midsized public university. The findings indicate that the monograph is the predominant format for historical research. They support the conclusion drawn in previous studies that humanities and social sciences research relies on the monograph, whereas research in the natural sciences and technology relies on the journal article. Journal usage in the examined theses was surprisingly low, even compared with recorded usage in other social sciences.

Olatokun, W.M. (2009) carried out a research on "Citation analysis of dissertations submitted to the Department of Animal Science, University of Ibadan, Nigeria". This study deals with Citations in master's degree dissertations submitted to the Department of Animal Science, University of Ibadan, Nigeria during the period 2000-2007 were analyzed for finding possible relationships between citing, cited articles and authors. Frequency and percentage distributions and measures of central tendency were used to analyze data. Findings showed that journals were the most utilized reference materials in the dissertations. Also, Poultry nutrition works had the highest number of dissertations followed by agricultural biochemistry and nutrition. The lowest number of dissertations was from forage production and management and monogastric nutrition with just two dissertations each. The findings from this study
could serve as a user study with implications for both collection development and user services designing libraries. Future studies could focus on ascertaining the A literature review is an attempt to identify, locate and synthesis complete research reports, articles books and other material about specific problem of research.

Scan Edom, (2009) in his book "Author cocitation analysis" in the chapter in a chapter "An Introduction to Bibliometrics and Informetrics” mentions that according to Ravichandra Rao (1983), bibliometric techniques are extensively used in the identification of trends in subjects such as the identification of core journals and fast patterns of library use. They are also used to build models of the study of scientific communication. Library use studies is one of the main bibliometrics used to measure the adequacy of a library collection, better serve and satisfy the needs of the users. Further, they aim to formulate mathematical models for patterns of library use in relation to different types of users and documents. These studies include the analysis of circulation statistics, obsolescence study in the use of documents over time, study of the relationships between circulation and acquisition, etc. Researchers build on each others’ and their own previous work. Definitions, topics and concepts are shared and interesting lines of inquiry need to be continuously followed up. To facilitate the progress- of an academic field, it is important to build such a cumulative research tradition. In this process of knowledge creation, it is necessary to identify, examine, and trace the intellectual linkage to each other in a given academic field as a basis of assessing the current state of its field to guide future development. The intellectual linkages are established through the process of referencing and citation. These intellectual linkages can be systematically examined by means of counting and analyzing the various facets of intellectual activity outputs in the form of written communication. Jasper W. Schneider and Pie Borlund, 2004 in their article "Introduction to bibliometrics for construction and maintenance of thesauri: Methodical considerations" introduce bibliometrics to the research area of knowledge organization - more precisely in relation to construction and maintenance of thesauri. They further state that this paper reviews related work that has been of inspiration for the assembly of a semi-automatic, bibliometric-based, approach for construction and maintenance. Similarly, this paper discusses the methodical considerations behind the approach. In the context of knowledge organization, the paper outlines two fundamental approaches to knowledge organization, that is, the manual intellectual
approach and the automatic algorithmic approach. Bibliometric methods belong to the automatic algorithmic approach, though bibliometrics do have special characteristics that are substantially different from other methods within this approach.”

Vinkler (2009) has highlighted several simple and sophisticated scientometric indicators generally applied in the literature (e.g. total number of publications and citations, citations per journal paper, relative citedness indexes, Hirsch index, etc.), which may characterize the publications of scientists both qualitatively and quantitatively. The calculation methods generally use data referring to the total set of papers studied. Scientific progress, however, may be attributed primarily to information in the highly cited publications. Therefore, a new indicator ($\pi$-index) is suggested for comparative assessment of scientist’s activity in similar subject fields. The $\pi$-index is equal to one hundredth of the number of citations obtained to the top square root of the total number of journal papers ranked by the decreasing number of citations.

Suluimanov, Frolova and Casanova (2009) have analyzed the results of the scientometric analysis of foreign publications by Kazakh authors that reflected in the SCOPUS database in 1991-2008. The publication activity is expressed in 3883 documents, the citation index of which is 10 132. The average share of Kazakh publications in the total worldwide flow is equal to 0.017%. The citation rate of publications was revealed to have significantly grown since the 1996-2000 period. It is shown that most articles were written in English and published in periodical editions. The main themes of publications are represented by physics and chemistry. The leading foreign partners of Kazakhstan in the scientific sphere were determined. Kazakh-Russian scientific cooperation is developing most fruitfully in the present century.

Jacso (2009) discussed the Publish or Perish (PoP) software and finds that is a swift and elegant tool to provide the essential output features that Google Scholar does not offer. It is found that PoP allows the user to edit the result lists presented in a compact, efficient grid-format. It facilitates the identification and removal of duplicate entries by offering dynamic sorting of the set by eight metadata elements, un-checking items and instant recalculation of the indicators. Some changes are recommended to enhance this useful utility by allowing users to clean and edit the 35 erroneous entries in the result set, and then back-load it to PoP for the recalculation of
the indicators. It is also suggested that the option to upload into PoP the result lists produced in CSV format from Web of Science and Scopus (which have much more reliable and reproducible data than Google Scholar) should also be offered. The result of recent experiments in calculating the h-index and other bibliometric and scientometric indicators from Google Scholar with the Publish or Perish software.

Garfield (2009) has highlighted Scientometrics and Bibliometrics that are now at least half a century old. Indeed, the field can be traced to early quantitative studies in the early 20th century. In the 1930s, it evolved to the "science of science." The publication of J.D. Bernal's Social Function of Science in 1939 was a key transition point but the field lay dormant until after World War II, when D.J.D. Price's books Science since Babylon and Little Science, Big Science were published in 1961 and 1963. His role as the "Father of Scientometrics" is clearly evident by using the HistCite software to visualize his impact as well as the subsequent impact of the journal Scientometrics on the growth of the field. Scientometrics owes its name to V.V. Nalimov, the author of Naukometriya, and to Tibor Braun who adapted the neologism for the journal. The primordial paper on citation indexing by Garfield which appeared in Science 1955 became a bridge between Bernal and Price. The timeline for the evolution of Scientometrics is demonstrated by HistCite tabulation 42 of the ranked citation index of the 100,000 references cited in the 3000 papers citing Price.

Ying (2009) has described a method that can solve the selection problem of peer review experts - scientometrics. From the external part of the scientific community, we can deal with the expert selection of peer review that is the internal part of the scientific community in essence. Only the scientific selection of peer review experts can guarantee the scientific evaluation of the objectiveness, impartiality and fairness.

Larowe et al. (2009) examined the Scholarly Database aims to serve researchers and practitioners interested in the analysis, modeling, and visualization of large-scale data sets. A specific focus of this database is to support macro-evolutionary studies of science and to communicate findings via knowledge-domain visualizations. Currently, the database provides access to about 18 million publications, patents, and grants. About 90% of the publications are available in full text. Except for some datasets with restricted access conditions, the data can be
retrieved in raw or pre-processed formats using either a web-based or a relational database client. It explains the database design, setup, etc., and reports the temporal, geographical, and topic coverage of data sets currently served via the database. 43

**Trimble (2009)** has reviewed that counting papers and citations is one of the way to estimate the significance of particular astronomical telescopes and other facilities in the long time gap between the verdict of history and the referee's report on the recent proposal. This has been done for 2,184 observational astronomy papers published between 1960 and 1964 (with 14,237 citations in 1965-1969) and the numbers looked at in various ways. The extreme dominance of California in optical astronomy and of the UK and Australia in radio astronomy provides the background against which ESO, NOAO, NRAO, and A&A were founded, with equality of access to facilities having increased enormously in the intervening 40 years, but inequality of results have increased slightly.

**Thanuskodi (2010)** discussed the research output performance of social scientists on social science subjects. The analysis cover mainly the number of articles, authorship pattern, subject wise distribution of articles, average number of references per articles, forms of documents cited, year wise distribution of cited journals etc.

**Park (2010)** Volume 1998 to 2007. The findings showed that single author contribution was the highest with a ratio of 88.6%; most of the authors were Pakistani with a ratio of 66.9% followed by North Americans. Male authors were dominant with a proportion of 61%. Majority of the articles were descriptive with 61% and two-third (65.7%) of them were in English language. The popular subject category was "industry, profession and education." The literature of D-Lib Magazine was covering thirteen years and the data were collected by examining issues from July 1995 to May/June 2008. The findings showed that two and more authors' contribution was the highest with a ratio of 57%; most of the authors had a single

**Noorhidawati and Kiran (2010)** highlighted the web performance of Asian institutional repositories through global visibility and performance of Asian top ranked universities in the archiving and sharing their research output through institutional repositories, based on the Ranking Web of World Repositories (RWWR). Their findings signify Japan as the biggest contributor of Asian repositories, followed by India and Taiwan. It shows that only 48 of them are listed in the Top 400 RWWR.
This implies that only 12% of Asian institutional repositories are visible and incorporate good practices in their web publication as extracted from the quantitative webometrics indicators used by the ranking. It is suggested that if the web performance of an institutional repository of a research institution is below the expected position, the university authorities should reconsider their web policy to increase the volume and quality of their intellectual output / research publications through institutional repositories. In the present study, the number of web pages, in links, external in links and also the overall and absolute WIFs for 44 private universities with exclusive and active websites were calculated using Alta Vista search engine. Then, the websites were compared and ranked according to the mentioned webometric indicators. The literature of D-Lib Magazine was studied by Park (2010) which covered a period of thirteen years and the data were collected by examining issues from July 1995 to May/June 2008. The findings proved that, two and more author's contribution was highest with a ratio of 57% and most of the authors had a single contribution. The proportion of the male authors was much higher with a ratio of 74% then female contribution. The study also revealed that, authors from the United States contributed 70% of the articles and the average number of references per article was 15.

**Jacob, Daisy. (2010)** since 1958 Bibliometric has evolved as a field, taught in Library and Information Science School and it emerged as a tool for scientific evaluation for a number research group around the world

**Asha and Anil (2010)** undertook a bibliometric study of 4798 citations appended to 400 articles in five volumes (2003-2007) of the Indian Journal of Pure and Applied Mathematics and found that the most cited documents are articles from research journals and the foreign authors have contributed more than Indian authors.

**Thehvell, Mike. (2010)** bibliometric study have identified webometric as one of the largest information science field, webometric research is relatively theoretical and as a new research field.

**Pillai, Sudhier K. G. (2010)** carried out a research on "Scientometric Study of Doctoral Dissertations in Biochemistry in the University of Kerala." In this study out of 168 PhD theses 21 were selected as samples by simple random sampling. Objective was to discover trends in biochemistry research, most frequently cited journals in the
field, and most frequently cited books in biochemistry and subject distribution of theses and the main areas of research. In this Journal of Biological Chemistry was on first rank.

**Si, Linbo (2010)** has carried on the statistical analysis to the published papers, column set, author and citation of Tsinghai Journal of Education (2007-2008) through applying the method of scientometrics, and makes the appraisal of its publication characteristic and academic influence accordingly.

**Srinivasa Ragavan et al. (2010)** analysed the Publication pattern of Harvard Business Review (HBR) from 1999-2010 and the journal is a premier periodical in Business and Management published from Harvard Business School, Boston. United States. The study is based on the 3329 research articles received 8167 Global Citation Scores coverage during the study period. The Source of the study is the internationally known and highly used and authentic database, Web of Science. The paper illustrates authorship pattern, growth of publications, source-wise distribution, institutions wise distribution, and h-index based on the analysis of the data. The country wise analysis reveals the USA as major contributor with 47.40% of total literature.

**Builova and Osipov (2010)** have scrutinized the information and the analytical survey of the papers was submitted to the Second International Nanotechnology Forum held in Moscow in October 2009. Scientometric data on the participants, their region oriented origins and research centers, as well as an analysis of the advancements and problems of Russian research in nanotechnologies, are given.

**Vinitha et al. (2010)** have attempted to analyze quantitatively the growth and development of water resource management research in India in terms of publication output as reflected in Web of Science database for the period between 1982-2009. Scientometrics is concerned with the quantitative features and characteristic of science. Large scale scientific research has become a major impetus of scientific advances.

**Li and Hou (2010)** have reviewed the changes of 5 Finance and Economics universities based on the analysis of a series of scientometric indicators. The following indicators are calculated for each university: Peer Review, the quality of research output, the quality of academic staff, Foreign content and faculty/student
ratio. The stakeholders of higher education institutions use these scientometric indicators to determine the rankings. For more just and impartial, the main emphasis of this paper uses the h-index to grade or rank journals for evaluating university researcher’s performance.

**Guns and Liu (2010)** have investigated scientific collaborations in China in the context of international collaboration on the basis of a co-authorship network (in the field of scientometrics), using Q-measures as indicators of internationalization in collaboration. The results show that a relatively small group of Chinese researchers is internationally active, and that most of them mainly form bridges between China and other countries. There is a clear dominance of three institutes, viz. ISTIC, Dalian University of Technology, and Henan Normal university. The main domestic broker for China is Liang Liming, whereas the main foreign broker for China is Ronald Rousseau. A small amount of international collaborations takes place outside the largest component of the network.

**Surulinathi et al. (2010)** have analyzed the research publication performance of Wi-Fi Communication research literature which is an important aspect of the content and meaning of the present study. Scientometric studies are used to identify the pattern of publications, authorship, citation and secondary journals coverage in the hope that such regularities can give and insight into the dynamics are under consideration.

**Vinkler (2010)** has determined the eminence of scientific journals, a new indicator stressing the importance of papers in the "elite set" (i.e., highly cited papers) is suggested. The number of papers in the elite set ($P_{\pi v}$) is calculated with the equation: $(10 \log P) - 10$, where $P$ is the total number of papers in the set. The one-hundredth of citations ($C$) obtained by $P_{\pi v}$ papers are regarded as the $\pi_v$-index which is field and time dependent. The $\pi_v$-index is closely correlated with the citedness ($C/P$) of $P_{\pi v}$ papers, and it is also correlated with the Hirsch-index. Three types of Hirsch-38 sets are distinguished, depending on the relation of the number of citations received by the Hirsch-paper (ranked as $h$) and the paper next in rank ($h + 1$) by citation. The $h$-index of an Anomalous Hirsch-set ($AH$) may be increased by a single citation to a paper outside the Hirsch-core. (A set of papers may be regarded as $AH$, where the number of citations to the Hirsch-paper is higher than the $h$-index and the next paper in rank shows as many citations as the value of the $h$-index.).
Opthof and Leydesdorff (2010) have highlighted the Center for Science and Technology Studies at Leiden University and advocate the use of specific normalizations for assessing research performance with reference to a world average. The Journal Citation Score (JCS) and Field Citation Score (FCS) are averaged for the research group or individual researcher under study, and then these values are used as denominators of the (mean) Citations per publication (CPP). Thus, this normalization is based on dividing two averages. This procedure only generates a legitimate indicator in the case of underlying normal distributions. Given the skewed distributions under study, one should average the observed versus expected values which are to be divided first for each publication.

Yang (2010) has used the Web of Science; this article researched recent developments and changes in the Scientometrics by bibliometrics analysis of articles, proceedings papers, letters and reviews published in the journal Scientometrics during 2000 to 2010 and the citation to these papers. The research indicates that Scientometrics is in the active stage of development in recent years. The United States, Spain, Belgium and China are the most active countries in the field of Scientometrics. The study also identified the most active research institutes, researchers, and subject areas the Scientometrics applied to.

Si (2010) has carried on the statistical analysis to the published papers, column set, author and citation of Tsinghua Journal of Education (2007-2008) by applying the method of scientometrics, and makes the appraisal of its publication characteristic and academic influence accordingly.

Sarkhel and Raychoudury (2010) reviewed in detail of the papers published in Vidhan Chandra Krishivishwavidhyalya (BCKV), Mohanpur, and West Bengal from the CAB abstracts for a fifteen year period from 1993 to 2007. A total of 2,807 papers were indentified and analyzed on seven different parameters. Their results showed that there had been a to spy turvy growth in the research publications during the period. The journals in which the papers were published by BCKV were ranked on the basis of number of papers with their NAAS rating. The authorship pattern of the papers indicated the trends towards collaborative research.

Swain (2011) in his scientometric analysis of Library Philosophy and Practice from 2004 to 2009 found that the degree of collaboration in LPP ranged from 0.222 to
0.52 and the highest numbers of contributors hailed from Nigeria, followed by USA, India, and Iran

Chen and Guan (2011) measured the quality of research of literature published in the field of Nano biopharmaceuticals countries, artifacts (the documents used in communicating scholarship and their aggregates [e.g., journals]), and concepts (the topics under examination). Her three-fold classification is used here to structure the review of the literature. The aim of this review is not comprehensively describe all bibliometric studies of LIS; rather, the objective is to identity salient findings about LIS derived from previous bibliometric analyses and to identify gaps in our knowledge of the field.

Warraich and Mali mood (2011) studied the Pakistan Journal of Library and Information Science for a six year period from 1995 to 2011. In this study, the authors came up with the findings that most of the authors i.e. 72 (85.71%) contributed only one paper and maximum papers, 54 (48.65%), were from the University of the Punjab, Lahore. Majority of the papers were research papers and 70 percent were written in English language. The study also revealed that, almost 60% of papers’ length ranges 6-20 pages and average length of papers was 8.84 pages.

Thanuskodi, S. (2011) Web-based information resources have great role to play in academic & research activities, keeping this fact in view, information professionals are largely depending upon the web-based information resources.


Echezona, R.I. (2011), carried out a research on "Information Sources Used by Postgraduate Students in Library and Information Science: Citation Analysis of Dissertations" in this study a citation analyses that assesses references of theses submitted to the Department of Library and Information Science at the University of Nigeria, Nsukka from 1997 to 2007. The results revealed that journals are cited more than other information resources, and online resources cited were very rarely from 1997-2005, but increased from 2006 and 2007. College and Research Libraries is the
most cited journal. The major subject area covered in their research is library management administration; user studies, information communication technology, and collection development while bibliometrics, preservation, special and public libraries were less commonly researched.

**Hussain, Akhtar (2011)** carried out a research on "A Citation Analysis of Top Research Papers of Computer Science “the study intends to evaluate the top papers of Computer Science as reflected in Science Direct. Moreover, it aims to find out authorship pattern, ranking of authors, ranking of country productivity, ranking of journals, and highly cited papers of Computer Science. The citations data have been collected from the quarterly list of hottest 25 research articles in the subject field of Computer Science from Science Direct database. In the present study, 20 issues of the alert service beginning from January/March 2005 to October/December 2010 containing a total number of 495 articles in Computer Science have been taken up for analysis. The study reveals that out of 495 top papers; three-authored articles are little ahead than two authored articles followed by four-authored articles and the country productivity of USA is at the top followed by UK, Taiwan, China, and Canada. Moreover, it finds that European Journal of Operational Research occupies the top position followed by Computers in Human Behavior, and Pattern Recognition.

**Pradhan, P. (2011)** the study presents the trends in "Authorship pattern and author's collaborative research in Indian chemistry literature” with a sample of 53,977 articles downloaded from SCI-Expanded database in Web of Science during the period 2000-2009. The average number of authors per article is3.55 %. In the study the degree of collaboration (C) during the overall 10 years (2000-2009) is0.03, but the year wise degree of collaboration is almost same in all the years of mean value0.97. In the 10 years of period, the multi-authorship articles are higher and predominant on single authorship. The study found that the researchers in chemistry are keen towards team research or group research rather than solo research.

**Prasad, S.G. (2011)** carried out a research on "Citation Analysis of Doctoral Studies in Marine Geology of Andhra University". In this study researcher has examine 52 doctoral theses in Marine Geology submitted to Andhra University during the period 1954-2009. A total of 9,453 citations were analyzed for identifying their bibliographic form, authorship pattern, ranking of cited journals and subject wise distributions of citations. The finding reveals that nearly 71.27% citations were from
journals and 13.51% from books. The subject-wise distribution of theses reveals that sedimentology, Geology, Marine Geology, Oceanography, Geochemistry and General Science and forms 73.16% more than half of the total theses submitted during the period. USA, India and UK are contributes 7875 (83.77%) citations. The authorship pattern study reveals that the highest number of journal citations from multi authors nearly 73.7%.

Raman, S. (2011) carried out a research on “The Department of Soil Science and Agricultural Chemistry, College of Agriculture, Vellayani, Thiruvananthapuram”. In this study they have examine 129 theses during the period of 1963 to 2010, have been submitted in soil science. A study of the citations in a sample of 18 theses, selected at 10 year intervals is carried out with a view to ascertaining the characteristics of the information sources used by the scholars. The 18 theses selected as sample, altogether carries 1794 references distributed among different categories such as monographs and reference books(58.58%), papers in learned journals (68.84%), conference papers/proceedings (4.12%), government publications (4.35%), theses (6.4%) and other (7.69%) which include technical reports, statistical bulletins and research reports. Analyzing the age of cited items, the obsolescence rate of literature in soil science was calculated. Median citation age is found to be 11.13 years. Chronological variation in the various characteristics of the cited literature was also examined.

Sahu, A.K. (2011) carried out a study on "Research publications of National Metallurgical Laboratory during the year 2001-2010 - A study on citation patterns". In this study R&D publication growth, its characteristics, research impact, quality, citation value, category of journals, core research areas, characteristics of productive authors with reference to the National Metallurgical Laboratory, an R&D organization under CSIR, India is analyzed. Based on data obtained from the Science Citation Indices, it was found that the highest number of 120 papers was published by the laboratory in the year 2010, out of which 28 papers received 62 citations during the same year for the papers published by the laboratory whereas the highest citation received was 738 from 88 out of loppers published in 2006 as on April 2011. Result was R&D contributions made by scientists of CSIR-NML had a global impacting the field of metallurgy and materials science. High citations received were in the areas of Materials Science, Metallurgical Engineering, Nano-Science & Nanotechnology and
Environmental Engineering over the last decades as observed during the period 2001-2010. Then-index of the last decade was 25

**Vijay, K.R. (2007)** carried out a study on “Journal of Food Science and Technology: A bibliometric study”. Bibliometric analysis of 779 articles published, along with citations in five volumes 37(2000) to 41(2004) has been carried out. A similar study was also carried out for the maiden volume of the same journal for the year 1964. The number of contributions and their distribution in different volumes, authorship pattern, foreign and Indian authored contributions, institution-wise contribution, citations, types of publications cited, geographical distribution of contributions national and International as well as physical growth of the journal have been studied. Results indicated an increase in the number of contributions in successive volumes with India being the major contributor both in the maiden volume as well as in the five volumes studied. The highest number of contributions is by the joint authors (two). The growth and popularity of the journal is showing a steady upward trend, though contributions from the developed nations form only 15% of the total.

**Karpagam et al. (2011)** have analyzed the growth pattern of Nan science and Nanotechnology literature in India during 1990-2009 (20 years). The Scopus international multidisciplinary bibliographical database has been used to identify the Indian contributions on the field of nanoscience and nanotechnology. The study measures the performance based on several parameters, country annual growth rate, authorship pattern, collaborative index, collaborative coefficient, modified collaborative coefficient and subject profile. Further the study examines national publication output and impact in terms of average citations per paper, international collaboration output and share, contribution and impact of Indian Institutions and impact of Indian journals. 26

**Raja and Balasubramani (2011)** have analyzed plasmodium falciparum research publication in India measured from Histcite software and other tools. The results show that the growth of Indian literature in plasmodium falciparum deposition and make the quantitative assessment of the research in terms of year-wise research output, geographical distribution, nature of collaboration, characteristics of highly productive institutions and the channel of communication used by the scientists.
Bjurström and Polk (2011) have demonstrated that IPCC Third Assessment Report is strongly dominated by Natural sciences, especially the Earth sciences. The Social sciences are dominated by Economics. The IPCC assessment also results in the separation of the Earth, Biological and Social sciences. The integration that occurs is mainly between closely related scientific fields. The research community consequently imposes a physical and economic bias and a separation of scientific fields that the IPCC reproduces in the policy sphere. It is argued that this physical and economic bias distorts a comprehensive understanding of climate change and that the weak integration of scientific fields hinders climate change from being fully addressed as an integral environmental and social problem. If climate change is to be understood, evaluated and responded to in its fullness, the IPCC must broaden its knowledge base and challenge the anthropocentric worldview that places human beings outside of nature. 27

Zheng, Yanning et al. (2011) have identified the list of highly-productive countries, institutions, authors, and fields in physics. Based on the analysis, it is found that the USA is the world leader in physics, and Japan has maintained the highest growth rate in physics research since 1990. Furthermore, the research focus at Bell Labs and IBM has played vital important roles in physics. A striking fact is that the five most active authors are all Japanese, but the five most active institutions are all from the USA. In fact, only University of Tokyo is ranked among the top 11 institutions, and only American authors have single-author articles ranked among the top 19 articles. The highest-impact articles are distributed across 25 subject’s categories. Physics, Multidisciplinary has 424 articles, and is ranked at No. 1 in total articles; followed by Physics, Condensed Matter. Citations are a way to show how researchers build on existing research to further evolve research. The citation count is an indication of the influence of specific articles. The importance of citations means that it is valuable to analyze the articles that are cited the most. This research investigates highly-cited articles in physics (1979-2008) using citation data from the ISI Web of Science. In this study, 1544205 articles were examined.

Choi, Kyeyoun et al. (2011) have investigated research trends on smart textile and clothing and to suggest future research directions on smart textile and clothing by using scientometrics approach. The research of smart clothing was divided into five
categories: technology, human factors, application, manufacturing, and consumer demands and retailing. Technology has emerged as the dominant category suggesting technological development of smart materials and wearable input devices have been intensively studied and have provided a solid foundation for smart clothing research. The number of research on output devices and data and power transportation showed a gradually increasing trend since 2000. Analysis on technical collaboration among each research field showed a high correlation between input technology and the three main categories: smart materials, functional application and, manufacturing. Material sciences, electronic engineering and computer sciences were shown to be major research disciplines to lead smart clothing research based on quantity of publications.

**Builova and Osipov (2011)** have briefed information and analytical survey of the papers that were submitted to the Third International Nanotechnology Forum that was held in Moscow on November 1-3, 2010. Scientometric data on the participants, their origins by region and research center, as well as an analysis of the achievements and problems of Russian research on nanotechnologies, are given.

**Poornima et al. (2011)** have analysed of 1060 publications published by Indian scientists during 1998 to 2010 and indexed by Web of Science online Database indicates that the publication output in the Indian Research Publication. Centre Food Technology Research Institute, BARC, Indian Institute of Technology, Defense Food Research Lab and institutes are the major producers of research output. Most of the prolific authors are from the highly productive institutions. This work is to provide a profile of research in Indian Research Publication in India. This includes tracking the number of papers, scatter of papers over journals, and its effect on publication output, authors’ institutional affiliations and authorship patterns.

**Konur, Ozcan (2011)** has explored the characteristics of the literature on the algae and bio-energy published during the last three decades, based on the database of Science Citation Index-Expanded (SCIE) and Social Sciences Citation Index (SSCI) and its implications using the scientometric techniques. The results of this work revealed that the literature on the algae and bio-energy has grown exponentially during this period reaching 717 papers in total. Most of document type is in the form of journal articles, reviews, and proceedings, constituting 98% of the total literature and English is the predominant language (97.6%). USA, China, Germany, and England are the four biggest contributing countries on the algae and bio-energy
literature publishing, 26%, 8%, 8%, and 8% of the sample, respectively. The Chinese Academy of Sciences is the largest institutional contributor publishing 2.6% of the papers. The most publishing four authors are Wilhelm (13 papers) followed by Wu (15 papers), Mimuro (10 papers), and Zhao (9 papers). "Bioresource Technology" is the most publishing journal with 24 published papers, followed by "Journal of Applied Phycology" (17 papers), and "Biotechnology and Bioengineering" (15 papers). "Biotechnology & Applied Microbiology" is the subject area with 24.3% of the sample published. This is followed by "Energy & Fuels" (16.3%), "Marine & Freshwater Biology" (14.2%), and "Environmental Sciences" (12.3%). The total number of citations is 11,079, giving a ratio for the "Average Citations per Item" as 15.45 and "H-index" as 52. A list of most-cited 25 authors is produced and Chisti (2007) receives 320 citations with 80 total average citations per year. This paper is followed by Lewis and Nocera (2006; 296 citations), Demirbas (2001; 187 citations). Chisti (2007) has the highest impact on the literature on the algae and energy with total average citations per year of 80. This is followed by Lewis and Nocera (2006, 59.8 annual citations) and Chisti (2008, 41 annual citations).

**Surulinathi et al. (2011)** analysed the Indian literature output scanned in Web of Science during 1999–2011 on solar energy research indicates that the growth of the literature. The area of solar fuels and Material sciences multidisciplinary has received maximum attention. Publication output of literature by different countries collaboration follows the trend in basic sciences with USA and South Korea being the major producers with India. The contribution of Indian Institutions and Global Citation Scores, h-index, g-index and gh-index has been analysed.

**Abbasi and Biglu (2011)** have analyzed quality and quantity of scientific productions originated by Iranian medical sciences Universities during 1999-2008. All raw data was extracted from the database of Web of Science during 1999-2008. The findings of study showed that the number of scientific productions emanated by Iranian Medical Sciences Universities has increased through the study period. The number of scientific productions increased from 259 documents in 1999 into 15852 documents in 2008, an increase of greater than 60 times. Articles were the most frequent document type indexed in the WoS. English language was the dominant language of publications. Pharmacology and pharmacy have been the most interesting subject area for researchers in theses universities. Despite fluctuations in the number
of received citations in scientific productions and H-index of these universities during study period, the number of self-citations has increased significantly, but in terms of citation average per paper, a descending order was observed during the study decade.

Khan et al. (2011) have founded that e-government literature in developing countries has somewhat adopted a balanced approach and is moving away from a merely theoretical or conceptual bases toward an empirical foundation. However, the literature lacked depth and balance in terms of issues/topics discussed and methodologies applied. In the light of the findings, strengths, limitations, and future directions for e-government research in developing countries are discussed. Utilizing scientometrics approach; the authors have analyzed and synthesized e-government (EG) literature that deals with the issues/topics in developing countries from the lens of socio-technical theory (STT). 145 articles from 7 core e-government journals published during the last decade were selected and reviewed for analyzing e-government literature related to developing countries. The growth pattern of e-government literature shows that e-government studies pertaining developing countries issues/topics have rapidly increased during the last decade covering a range of topics/issues studied from socio-technical aspects.

Waltman et al. (2011) highlighted the crown indicator as a well-known bibliometric indicator of research performance developed by our institute. The indicator aims to normalize citation counts for differences among fields. They critically examined the theoretical basis of the normalization mechanism applied in the crown indicator. They also make a comparison with an alternative normalization mechanism. The alternative mechanism turns out to have more satisfactory properties than the mechanism applied in the crown indicator. In particular, the alternative mechanism has a so-called consistency property. The mechanism applied in the crown indicator lacks this important property. As a consequence of our findings, we are currently moving towards a new crown indicator, which relies on the alternative normalization mechanism.

Mallinath Kumbar and Girish Kumar (2011) studied the authorship trend and collaborative research in Genetics and Plant Breeding based on the data collected from the Indian Journal of Genetics and Plant Breeding published during 1998 to 2002. Out of the 486 total articles, two authors papers were maximum (44.24%) and
the degree of collaboration was 0.87. The number of single authored full length articles and short communications were 61 as compared to 426 of those by multiple authors. They also noted that the contribution from research institutions and laboratories was vividly ahead (44.08%) of other segments such as universities and colleges. Out of the total 486 papers, 475 were by the Indian authors, where the highest were from the Delhi state (22.49%).

Swain and Panda (2012) conducted a bibliometric study on Journal of Intellectual Property Rights, 2002 to 2010 and found that due to absolute domination of solo contributions, the visibility of collaborative contribution was found remarkably less. The study further revealed that about one third of the total publications received citations, more than half of the cited articles carried just one citation, one fourth got 2 citations, and the rest received citations between 3 to 9 times. Jena, Swain and Sahu (2012) in their bibliometric study of

Mulla (2012) has described the bibliometric analysis of 998 articles of on information science and scientometrics (ISS) that appeared in different journals during the period of 2005-2009. The study reveals that, most researchers preferred to publish their research results in journals; as such 91.98% of articles were published in journals. More numbers (329, 32.97%) of articles were published in 2009. The authorship trend shows that, out of 1703 authors who contributed a total of 998 articles, out of which more number of (376, 40.96%) articles were two authored papers. The degree of collaboration in ISS was 0.78, and the country wise contribution of articles, India would contribute more documents i.e., 83.99% of the total publications. It also further examines year wise distribution of articles, distribution of types of documents, length of the papers, authorship pattern, degree of collaboration among authors, degree of collaboration among co-authors, degree of collaboration among different category of authors, rank wise distribution of collaborators, institution wise distribution of articles, country wise distribution of contributions, state wise distribution of contributions, journal wise distribution of articles.