Chapter – II

REVIEW OF LITERATURE
REVIEW OF LITERATURE

2.0 Introduction

A literature review is a “critical analysis of a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical articles” (University of Wisconsin Writing Center). An descriptive study of the literature related to the particular field or topic is called as a Literature review. This provides an idea of what has been done, providing right information at the right time. It further provides other findings of research.

A review of the literature shows that citation analysis is often used to investigate and understand patrons' information needs and determine the value of individual journal titles in specific disciplines.

The main purpose of this chapter is to throw light on the literature on citation analysis. In any research literature survey forms an integral part. The researcher has made an attempt to gather data relating to citation analysis pertaining mainly to agriculture science along other subjects. It further helps to find out past, present and future status of a given research topic. It mainly avoids the duplication of research work.

2.1 Review of Literature

In past many studies have already been done on ‘Citation Analysis” in all discipline of subjects as well in Library Science also. Stating back from Sangam, 1986; Dharmapurikar, 1987; Hambarde, 1989; Jadhav, 1990; Kannappanava, 1991; Berhanuddin, 1992; Surve, 1992; Bhande, 1993; and the recent studies from K.P. Singh 2013; T. Raghunadha Reddy 2012; Mr.AnjanGohain 2014; Y. L. Somashekara 2015 and Chandrakant R. 2016.

The review of literature is grouped under the following headings.

- Citation Analysis in Humanities and Social Science
- Citation Analysis in Science and Technology
- Citation Analysis in Agriculture Science
2.1.1 Citation Analysis in Humanities and Social Science

Abdullah, Rahman and Azzah (2014) study reveals the outcomes of a study carried out to examine the pattern of information used by the graduate students in Islamic Studies Academy at University of Malaya, Kuala Lumpur. In total there were 14377 citations from 54 doctoral theses submitted between the years 2005 to 2009 was selected for the study of citation analysis. From the study it was clear that highest citations per dissertation were 684, and the lowest citation was 105. The study revealed that the resources used by these students are multidisciplinary by nature. Books and journals are cited more in compare with other forms of resources accounting 65% and 20% respectively. In-house journals namely JurnalSyariah and JurnalUsuluddin are the most popular cited journals. Along with this Malaysian language sources and Arabic language sources all also used up to 60% and 40% of total citations. About 30% of all the resources cited are above years of age. Further this study helps the librarians in understanding the sources used by the users and helps in collection development.

Ezema and Asogwa (2014) conducted a study taking two linguistics journals namely Journal of Linguistics and Applied Linguistics between 2001-2010. Bibliometric indicators like ranking of most frequently used journal along with authors, authorship patterns, degree of research collaboration and year wise scattering of articles in journals were covered in the study. In total 884 papers was reviewed. In turn a total of 15,283 bibliographic references with average of 17.2 citations per paper were found. Books and monographs references dominated representing 53.3 percentage followed by journals with 35.0 percent. In this cited sources more than 70% exceed the ten years old. The domination of single authorship pattern contributing up to 63.2 % while multiple authorship patterns with 36.8% were seen in the study. The study also reveals that the collaboration research is very low in linguistics. Thus, the study is useful for the researcher of linguistics and helping in collection development of libraries particularly supporting the linguistics researcher.

Kavitha and Sivaraj (2014) carried out a study in Periyar University, Salem, Tamilnadu covering the 23 years period from 1989 to 2012 taking 106 Ph.D as a sample for study of commerce department. The main purpose of this study is to find
the authorship pattern, contribution of citation by male and female researchers, bibliographic forms of reference, subject wise distribution and ranking of journals.

**Mishra, Gawde and Solanki (2014)** found that Bibliometric studies have been used to study various characteristics of subject literature, both literature cited and literature provided by the researchers. Analysis of bibliographical data permit the description of the characteristics of the literature produced in the field while analysis of citation data enable one to describe the characteristics of the literature cited, and presumably used by researchers in the field. There are several means and modes available to know the importance of various types of information resources of a particular field. But productivity and usability of a particular resource of a particular field can only be found out by using techniques of bibliometrics analysis. The present which is an attempt to know the citation pattern of research scholars of English by using bibliometrics techniques.

**Chamani (2013)** study analyses the citations of Masters Theses on Sociology at the University of Peradeniya submitted from 1995 to 2012 to determine the format and age of materials used and most frequently cited journals. The citation analysis method was used as the data collection method and the citations were extracted from the title pages and reference lists of each of the theses. Data obtained from 12 masters theses were examined in June, 2013. The study found that 56% of cited items were monographs followed by 22% were journals, 8.5% were reports, 4% were web resources and 3.7% were conference proceedings. This is contrary with other citation analysis, which found that journals are the most frequently used format. The study also revealed that nine journal titles are the most frequently cited journals by sociology graduates. The study indicated that the average age of materials used was 10-20 years. The findings and implications of the research for collection development have been discussed. This study could serve as a collection development tool that can be used as a model for the library to identify the primary sources for acquisitions and also as a guide for collection maintenance.

**Knievel (2013)** studied the 55 dissertations of students and Faculties’ master’s theses of Philosophy department of University of Colorado Boulder submitted
between the years 2005 to 2010 was selected. The study tries to compare the citation behaviors between faculties and student and examined difference in citation pattern between each group.

Singh and Bebi (2013) paper presents “citation analysis of PhD theses submitted in the discipline of sociology of the University of Delhi during 1995-2010”. 25 PhD theses of sociology have taken where 5766 citations are studied. Parameters like authorship pattern, types of literature, scattering of citations country wise, scattering of foreign and Indian citations and top 30 cited sociology journals rank list are present in this paper. 83.94 %, is the highest number citation was from single author, 67.23% and 22.20% citations were from books and journals respectively. The country-wise supply of citations discloses that 2536 (45.52 %) citations were from India and followed by USA and UK.

Maz-Machado et.al. (2012) paper analyses citation patterns in 30 doctoral theses in the field of Education Sciences, submitted at the University of Córdoba (Spain) between 1997 and 2010. A preference was found for citing books as opposed to articles. The most widely-cited journal was a Spanish education-specific publication, Enseñanza de las ciencias. Only a small number of journals from the stock of periodical publications held and managed by the Faculty of Education Sciences Library were cited.

Kalbande, Golwal and Sonwane (2012) carried out a study on Citation Analysis of Ph.D. theses submitted to Dr.Babasaheb Ambedkar Marathwada University Library, was performed as a way of determining the use of information sources made by the scholars of the university. For the present study 34 Ph.D. theses of Economics were chosen as a sample from the year 2000 - 2010, there are in all 2876 citations appended in 34 theses. The data collected from the bibliographical entries listed at the end of the theses, which was used by the researchers for completing the theses. The citations were photocopied and the data was collected. Citation analysis have been carried out to find the types of cited document, the chronological distribution of cited documents, to find out the authorship pattern of cited document. The rank list of cited journals books, to find out the language. Wise
distribution, geographical distribution of cited documents, the rank list of cited web–
sources and the cited authors.

**Kumar and Chauhan (2012)** studied Ph. D. Thesis submitted to the Department of Psychology accepted by H. N. B. Garhwal Central University Srinagar (Uttarakhand) which was taken as the source data for the study. A total of 18 thesis studied generated a total of 3442 citations. Distribution of citations by forms of documents, core journals, distribution of journals by frequency of citations, year wise and country wise distribution of journal articles cited were analysed. The results reveal that journals are the most preferred sources of information used by researchers in the field of Psychology accounting for 42.71% of total citations. Most of the citations cited from journals are from USA accounting 40.18 percent. This study will also provide guidelines in the decision making process with regard to acquisition and organization of documents and in quality collection of H. N. B. Garhwal University Library.

**Zafrunnisha (2012)** made a study on 77 doctoral theses submitted for the award of doctoral degree of Sociology to Osmania and Sri Venkateswara University, Tirupati, Hyderabad where 9,162 citation during the period 1974- 2005 were studied. It has been carried-out from 1974 to observe the distribution of authorship pattern, bibliographic form, core journals, country, language, subject wise distribution of journal citations and core periodicals. The single authored papers were highest contribution in book citations 76.77% of total citations, and multi authored papers were highest contribution 55.57% of the total journal citations. The sociology researchers in both the Universities referred mostly book source rather than other sources. Most of the publications cited by the sociology researchers were published by developed countries and all the citations were published in English language only.

### 2.1.2 Citation Analysis in Science and Technology

**Barnett-Ellis and Tang (2016)** sought to identify biology collection usage among graduate students at Jacksonville State University. Forty master’s-degree student theses from 2008 to 2014 were examined. A total of 2,351 citations were analyzed, of which journals accounted for 75%, books for 10%, and the remaining
15% included government documents, websites, dissertations, and theses. Findings are consistent with previous similar studies: students referenced journals more often than books and other sources. Journal and book citations present discrepancies between number of citations and number of authors citing. Wide ranges of journal subjects were cited due to the interdisciplinary nature of graduate programs. Recommendations are provided for future collection development and library instruction practice.

Ellegaard1 and Wallin (2015) found that keyword analysis identifies the most popular subjects covered by bibliometric analysis, and multidisciplinary articles are shown to have the highest impact. A noticeable shift is observed in those countries which contribute to the pool of bibliometric analysis, as well as a self-perpetuating effect in giving and taking references.

Gohain and Saikia (2014) study is based on 10983 citations, appended in the 30 PhD theses of chemical sciences submitted to Tezpur University, Assam for the award of doctoral degree during the period 2008-2012. The main purpose of this study was to investigate authorship pattern of the citations, type and form of literature cited, and compiled a rank list of core journals in chemical sciences. The study revealed that journals were the most preferred sources of information used by the researchers in the field of chemical sciences accounting for 78.83% of total citations, followed by books with 15.57 % citations. The Journal of Journal of American Chemical Society has ranked the first with 617 citations accounting for 7.13% of the total journal citations. Journal of Molecular Catalysis a: Chemical 6.57% occupies the second rank getting 569 citations, followed by Macromolecules 6.27% with 543 citations. Authorship pattern for journal citations shows that most of the citations were contributed by more than three authors that mean the collaborative research is prevailing in chemical sciences. The findings of the study revealed that out of the total number of 8658 journal citation, 39.89% are by more than three authors, followed by two authors with 22.28 %.

Punchihewa (2014) study is to find the resources used in the M.Sc. masters theses of University of Moratuwa submitted during the 2013. 84 theses were taken as the sample number for the study. Out of these 84 theses 3,360 citations were
extracted. The study revealed that the journals were used more in compare with other information resources. Along with journals the students also preferred online resources to a considerable extend. The outcome of the study could be used as an guide in improving the storage policies and in collection development of the library.

Satpute and Sonawane (2014) study covered a citation analysis of the ten Ph.D. theses of Electronics which was submitted for the award to North Maharashtra University Library covering ten years of data from 2000-2010. In all there were 1452 citations generated out of 10 theses. The main aim of this study is to find the types of authorship pattern of cited documents, chronological distribution of cited documents, rank list of books, journals along with geographical form wise distribution of cited documents and finally the rank list of authors of cited documents.

Banateppanvar et. al. (2013) determined the materials cited in Doctoral theses of the Zoology, submitted to the Kuvempu University, India during the year 2002 to 2006 with the aim of improving the existing collection development of the library. Data were extracted from title page and references given at the end of each chapter. The cited documents are recorded on 5”x3” slips and the same is tabulated in Microsoft Excel, and extracted data were analyzed using statistics. The study reveals that journals are the most preferred sources of information used by the researchers in the field of Zoology accounting for 74.47% of total citations followed by books and monographs 18.02% citations although, citations from conference proceedings, theses, reports, patents and newspapers are also found. It is also observed those researchers are taken advantage of internet resources. The Journal of Mutation Research has ranked the first with 94 citations accounting for 5.71% of the total journal citations. Further, Bradford’s Law of Scattering was applied. It is observed that major citation from journal literature. In addition, more cited materials were contributed by Multi authors and Degree of collaboration is 0.71.

Mulla, Dhanamjaya and Talawar (2013) found “Citations in Engineering Doctoral Dissertations: An Obsolescence Study” where six general universities of Karnataka namely Mysore, Mangalore, Bangalore, Karnataka, Kuvempu and Gulbarga universities have taken for study based on citation of PhD dissertations in
engineering and technology. ‘Obsolescence’ refers to the outdated materials in the libraries. Citations, scientometrics, bibliometrics and infometrics obsolescence studies is one of the primary area. The study was carried out to see the grasp of obsolescence in engineering literature cited in 137 doctoral dissertations awarded during 1961 to 2008 in engineering and technology. The study discloses that the among fifteen subjects 2014 citations were from book and 7467 citations were from journal articles. Further, the citations was taken from early 1990 to 2001, the book citations was 86% were of 9-39 years current related an huge portion of the journal citations of (68.58 %) used by the scholar was published 20 year back . This shows that extra journals literature cited throughout 1971-2000 similarly in books literature cited at time of 1961-1990.

Zong, Q. J., et. al. (2013) purpose is to map the intellectual structure of research in doctoral dissertations of Library and Information Science in China. By use of Co-word analysis, including cluster analysis, strategic diagram and social network analysis, we studied the internal and external structure and relationship of research fields in doctoral dissertations of Library and Information Science in China. Data was collected, during the period of 1994–2011, from six public dissertation databases and ten degree databases provided by the universities/institutes which have been authorized to grant doctoral degrees of Library and Information Science in China. The results show that Wuhan University is the most important institution of doctoral education in LIS in China. The focuses of researches, including information resource, ontology, semantic web, semantic search, electronic government, information resource management, knowledge management, knowledge innovation, knowledge sharing, knowledge organization, network, information service, information need and digital library. The research fields of LIS doctoral dissertations in China are varied. Many of these research fields are still immature; accordingly, the well-developed and core research fields are fewer.

Kumar and Reddy (2012) study of Citations of Master’s degree dissertations which was submitted during the period 2000 – 2007 to the Department of Library and Information Science, Sri Venkateswara University, Tirupathi was studies to see the relation between the bibliographic form, citing and citing articles. Finding of
percentage distributions, frequency and measures of central tendency along with suitable charts, graphs and tables were used to study the data. The study reveals that in dissertations the journals were the most used referenced material.

Larivière, Sugimoto and Cronin (2012) paper presents a condensed history of LIS over the course of more than a century using a variety of bibliometric measures. It examines in detail the variable rate of knowledge production in the field, shifts in subject coverage, the dominance of particular publication of different times, prevailing modes of production, interactions with other disciplines, and, more generally, observes how the field has evolved. It shows that, despite a striking growth in the number of journals, papers and contributing authors, a decrease was observed in the field’s market-share of all social science and humanities research. Collaborative authorship is now the norm, a pattern seen cross the social sciences. The idea of boundary crossing was also examined in 2010, nearly 60% of authors who published in LIS also published in another discipline. This high degree of permeability in LIS was also demonstrated through reference and citation practices: LIS scholars now cite and receive citations from other fields more than from LIS itself. Two major structural shifts are revealed from the data in 1960, where LIS changed from a professional field focused on librarianship to an academic field focused on information and use and in 1990, when LIS began to receive a growing number of citations from outside the field, notably from Computer Science and Management, as well as a dramatic increase in the number of authors contributing to the literature of the field.

Miller (2011) conducted a study on citation analysis of graduate masters theses from Carleton University's Biology Department with implications for library collection management decisions. Twenty-five masters theses were studied to determine citation types and percentages, ranking of journals by frequency of citation and by number of authors citing, and by age range of journal citations. The researcher examined what percentages of journals were accessible through the local catalogue and conducted further analysis of specifics regarding unavailability. Journals were also ranked by subject specialty. Results indicate that although the library has many of the journal articles cited, knowing why a citation was unavailable is useful for
establishing future purchasing needs. Although journal rankings are traditionally performed using total number of citations, the ranking by number of authors citing a source can make a difference when compiling core journal lists. The researcher concludes by discussing implications for collection development in times of fiscal constraint. Library management and cataloguing. Education, Social Sciences and Literature had the lowest citations. This study helps and serves for better collection development in libraries.

Sheshrao and Khaparde (2011) found that citation analysis of Ph.D. theses submitted to Dr. Babasaheb Ambedkar Marathwada University Library was performed as a way of determining the use of information sources made by the scholars of the university. In the present study, 30 Ph.D. theses of Physics were chosen as a sample from the year January 2004-December 2008. There are 5726 citations in 30 theses. The data were collected from the bibliographical entries listed at the end of the theses, which was used by the researchers for completing the theses. The citations were photocopied and the data was collected. Citation analysis is carried out to find the types of cited documents, the chronological distribution of cited documents, to find out the authorship pattern of cited documents. The ranked list of cited journals and books, to find out the language-wise distribution, geographical distribution of cited documents, the ranked list of cited web-sources and the cited authors were studied.

Shi-Jian, Wang-Zhi, and Feng-Ping (2009) study deals with citation analysis of 56 Ph.D., theses submitted to Wuhan University in China during the 2005. The area covered under this study are Stomatology, Photogrammetry and Remote Sensing, Biology and Library and Information Science the researcher compared and reviewed the features of the cited literature in these four disciplines. It was observed that English language plays a main role in the publication in the field of Biology and Stomatology, whereas in the field of Library and Information Science the citation were mainly from Chinese language. In the field of Remote Sensing and Photogrammetry there was an even split of languages between Chinese and English. At the end of the study the journals titles which were cited most frequently was present in the table which served as a guide to the students.
Uçak and Umut Al (2009) paper is to express the differences and similarities of inter-disciplinary scholarly communications through the citation analysis of theses. For this purpose, a total of 29,289 citations from 391 theses between years 1968-2007 were investigated using citation analysis. Samples were chosen according to layer-sampling techniques from 16 disciplines of four basic subject areas (social sciences, pure science, engineering, and arts and humanities). It has been found out that the characteristics of citations of the theses differ among academic disciplines. The study finds that literature obsolescence, language of resources, journal or monograph use, number of citations and authors are related to the disciplines and vary according to the subject areas.

Gooden (2001) studied citation analysis of dissertations accepted in the department of Chemistry at The Ohio State University data during 1996-2000 was carried out by the researcher to see the types of materials used by the Chemistry department. A total of 3,704 citations were generated from 30 dissertations. The different types of material cited, age of literature alone with dissertation topics were studied. In this study the researcher reveals that the journals are most referred resources followed by monographs with 85.8% and 8.4% each respectively. The results of this study may be used to support OSU Chemistry collection development.

2.1.3 Citation Analysis in Agriculture Sciences

Bala and Singh (2015) in this study, 17 doctoral theses were taken in that a total of 2723 citations were gathered. The theses were in the subject of Agronomy and Plant Breeding were submitted for award during the year 2010-2014 by CCHSHAU, Hisar. The study mainly highlighted on type of document cited, ranking of journals, geographical scattering of citations, authorship patterns etc. In both the subjects it was clear that the journals were highly cited resources with more than 70% with the contribution of two authors in the field of Agronomy and the contribution of two and three authors in the field of Plant Breeding. In the field of Agronomy the article cited were majority from India with 40% and in the field of Plant Breeding it is from USA with 20%. In both the subject Indian Journal of Weed Science and Theoretical and Applied Genetics occupies stands first in rank. Nearly, more than 50% of the journals
cited were between 12-14 years old and the Bradford’s law does not fit in the field of agronomy and plant breeding.

**Haque, Khan and Rahman (2015)** conducted a study to identify the main resources used by the various disciplines of Agricultural Sciences in Bangladesh Agricultural University (BAU) by adopting citation analysis. The list of 123 journals was prepared with their ranking. Along with this a scattering of chronological and geographical citations were also included in the study. This study helped the Agricultural University Libraries of Bangladesh in selection and acquisition of journals within the limited budgets.

**Kocher and Kelly (2015)** have made an attempt to study foods system is a new concept in the field of agriculture science. To have a better understanding on literature of food systems a citation analysis was done on four journals including the topic related to food systems. The analysis study involved the types of work cited, most commonly used are cited journals, age of literature cited, types of data cited, authors, geographical locations. The data collected helped the librarians in supporting this new area of research and will support the students and building appropriate library collections.

**Sagar, Kademani and Bhanumurthy (2014)** studies the agriculture research publications was analyzed in India during 1993-2012 based on the Web of Science database. The aim of the study was to do a scientometric evaluation of all agriculture research publications by Indian scientists. The limits of the study included domain-wise distribution of publications, growth of publications and citations, activity index, highly productive institutions, international collaboration highly preferred journals, and highly cited publications.

**Tunga (2013)** carried out a study of citation comprising of 545 journal have 8437 citation from 80 doctoral theses accepted for award by Bidhan Chandra Krishi Viswavidyalaya (BCKV) and Uttar Banga Krishi Vswavidyalaya (UBKV), West Bengal India covering 1991-2010. In his study he observed that the journals are the most referred materials in compare with other forms bibliographic forms of citations. In
his study it was found that multiple author citations are more. The half-life of journal article in this study was to be found 28.703 and calculated as (Median year) as 24 years.

**Fagbola and Mary (2012)** selected the Nigerian Journal of Horticultural Science for their citation study. The articles published during the year 1990-2005 that is volume 1-10 was selected for citation analysis. The data collected from the articles cited journals, books, reports, theses, dissertations, monographs, conference proceeding etc. to analyze all this a descriptive statistics methods were used.

**Fasae (2012)** conducted a citation study in Federal University of Technology, Akure (FUTA) in the department of Agricultural Economics and Extension. The major finding was that journals were the most consulted information resources for study this followed by book and with a very less utilization of web resources by the students of FUTA. It is stated in the study that one-third of the resource materials used for the research were recent journal on Agricultural Economics which was highly cited.

**Haque (2012)** purpose of the study aims to find out the citation and authorship patterns in the articles of The Journal of Poultry Science (JPS). The study covered from the year 2001-2010 and a total of 425 articles with 13012 citations were gathered during this period. In the study it was revealed that among the overall citations, journals articles represents 84%, books with 8% and another with the percent of 8. The ratio of author self-citation of total citations was 1:16. The ratio of journal self-citation of total citations was 1.58 and the documents cited were 20 years ago.

**Oyeniyi, Oluwakemi and Olaifa, (2012)** carried out a study taking the data 2000-2010 excluding 2008 data with the total number of 589 articles published by 1315 authors. This study evaluated the patterns in authorship and collaborative strength among the agricultural engineers in Nigeria, with the use of Nigerian Institution of Agricultural Engineers (NIAE). The result of the study shows that out of 589 articles 421 accounting 71.5% were joint authorship while on the other side only 168 accounting 28.5% were single authorship patterns. The degree of collaboration of authors was calculated to be 0.715. The study reveals that the two authorship rank first by 14 publication.
Kousha and Abdoli (2009) found three types of methods was adopted to evaluate and to see the merits of open access agriculture research. In the year 2005 they tried to compare the citation counts of self archived along with non-open access articles taking 400 research articles as sample from ISI-indexed journals of agriculture. During 2005-2007 they compared the impact factors of open access with non open access agriculture journals as stated by ISI journal citation reports. Again in the same year that is 2005 they compared the impact of citation taking 100 open access and 100 non open access as a sample publications from “Food and Agriculture Organization” of United Nations. To find the publication in open access journals they used Scopus databases and ISI for citation counting along with Google and Google scholar for finding self-archived articles. The study revealed that there is more advantage in self archived agriculture articles in comparison with non open access articles. From the sample of 400 articles published in non open access agriculture journals, nearly 142 were open access along with median citation count of 4 and the median citation count in non open access was 2. Finally, they concluded by stating that open access is an advantage for individual articles in compare with the whole journal article.

Olatokun and Makinde (2009) study examined the citation from 40 doctoral theses submitted to the department of animal science of Nigeria’s premier University, University of Ibadan between 2000 and 2007. The study discovered the journals were the most cited sources accounting 50% of total citations. This study also helped in identifying the journals which were helpful in the field of animal science. This points to the fact that this study could help as a user study with suggestions for both collection development and user services design.

Haparro-Martinez and Marzal(2008) analyzed the information used by the Agricultural Science Ph.D. theses submitted to Central University of Venezuela (UCV) between 1986 and 2002 in the Faculty of Agronomy. The analysis of the data got from 4,646 bibliographic references in 42 agricultural science PhD theses gives insight into information use in a Venezuelan agricultural science community. The multi-dimensional resources and types of indicators like self-citations, reference density, scientific production and cited documents, journals citations, scattering of
references can be analyzed from this study. The self-citations percentage varied widely. It was found that the half-life was 11 years. According to the supply of document type, journals articles were more. While internet and technical standards publications were rare. It was revealed from the study that the faculty of Agronomy PhD students mainly depend upon the Anglo Saxon literature. The findings will be useful for education planners in Venezuela and other developing countries.

Kuruppu and Moore (2008) made a study on type of information used by the students in the fields of agriculture and biological science at Iowa State University that is ISU. The was conducted taking the period from 1997-200 covering nine agriculture and biological science subjects. The research discussed the different ages and types of resources cited in these. Finally, the journal which was cited more was identifies in each discipline and the dispersion of journal title was examined.

Krishna (2007) carried out a study on citation analysis of Ph.D theses accepted for doctoral degree during 1996-2000 in Rajasthan Agricultural University (RAU), Bikaner. In the study it was clear that research scholars used journals as a major source of documents representing 71.1% followed by books with 29.15%. In the study it was revealed that the need of citation becomes very important to develop a standard tools for purchase of journals within the limited budget. It is was also clear that the joint authorship pattern is more with 37% followed by single authorship with 37% and 2% of corporate authorship.

Garg, Kumar and Lal (2006) studied the analysis of 16891 articles published by Indian scientists during 1993–2002 and indexed by Science Citation Index Expanded (Web of Science) reveals the articles publications in the agricultural sciences is coming down since 1998 onwards. Among the Indian agricultural research output Dairy and animal sciences and veterinary sciences play a major role. The major producers of research output are Agricultural universities and institutes under the Indian Council of Agricultural Research (ICAR). It was found from the study that most of the papers were published in local journal with a very low impact factor.

Kumbar, Harinarayana and Tejaswini (2005) studied collaborative research and trend in authorship patterns in the field of Agricultural Sciences. The data was
collected form The Indian Journal of Agricultural Science which was published during 2000-2001. The data reveals that three authored papers was more with 16 (34.02%) and in agricultural sciences degree of collaboration is 0.87. Based on the academic productivity the authors have been ranked. The study reveals that the laboratories and research institutions 190(39.42%) and universities of 456(94.50%) articles. a significant percentage 70(14.52%) is reported from U.P. state.

Dulle et. al. (2004) carried out a study of 295 M.Sc. theses and 21 P.h.D. theses submitted to Sokoine University of Agriculture between 1989 to 1999 and also 309 conference proceeding articles published during the same year. The major purpose of this study is to see the citation patterns among the agricultural scientists and to rank the core journals in the field of agriculture in Tanzania. From the study it was revealed that the agricultural scientists have a very limited access to current journals. The study suggested to have an electronic journals to overcome the situation of lacking of current journals by the agricultural scientist.

Farahat (2002) study covered the 19 Egyptian journals of agricultural science examining the patterns of authorship. It was found from the study that multiple authorship patterns were more in the field and co-authorship was later followed. In the multiple authorship patterns the involvement of three authorship was common. It was found that a substantial difference among sub-fields and co-authorship was more common in social-science related agricultural disciplines. The author found no major differences in patterns of collaboration in the agricultural sciences in Egypt and two other developing countries for which comparative data was obtainable, India and Pakistan.

Deshmukh (1998) conducted a citation analysis of the Ph.D. theses submitted to Punjabrao Krishi Vidyapeeth (1990-1994), The study revealed that journals are the most favoured category of resources among the researchers this was followed by books and it was found that co-authored citations were more. The Bradford’s law of scattering fits well in many disciples of agriculture science. Scholars in agriculture chemistry, agriculture economics, agronomy and horticulture are more dependent on current literature. Where as in agriculture extension, botany, entomology, plant pathology and veterinary science have cited older literature.
Lal and Panda (1996) study, they created a rank list of hundred journals which is used more frequently and cited in the field of Plant Pathology after evaluating the 20 dissertations at Rajendra Agricultural University. Khasier Jahan Begum and Lalitha K. Sami (1986) studied on trends in agricultural research of various branches along with its research collaboration, institution wise productivity of agricultural literature, ranking of journals, communication channels used, scholarship of paper based on the entries as in ISB (1976-1978, 1980-1983).

2.2 Findings

The literature published over the past 30 years has been covered to understand the trends and developments in the field of “Citation Analysis”. The study altogether have been categorized under many features of analysis include year of thesis submission, year of publication, bibliographic forms wise distribution, geographical scattering of citation, authorship pattern, ranking of authors, language wise distribution, publisher wise distribution and ranking of journals etc. The survey of literature showed that more studies have been conducted in the area of the above mentioned fields in India as well in USA, UK and Netherlands. While referring to the period of publication of literature in this field of study, it is evident that studies have been conducted since the past. The survey depicted that more number of research papers have been published during recent time. The survey of literature also revealed that many studies have been done especially in the area of ranking of journals, obsolescence analysis, and citation age with half-life. Next to this research has been done covering the other fields like authorship pattern, application of Bradford law of scattering, and decreasing frequency of journal citations. Thus, it is clear that of late studies are being conducted to make the ‘Citation Analysis” more effective and useful in all the field of research.

2.3 Conclusion

The above literature survey shows that there are number of resources available on citation analysis. For evaluating the collected data or for the library collection the citation analysis acts as major technique of bibliometrics further moving it helps the librarian in collection development and research scientists for their research work. Considering available literature present study has used measurable evaluation of current study.
References


Gohain, A., & Saikia, M. (2014). Citation Analysis of Ph. d Theses Submitted to the Department of Chemical Sciences, Tezpur University, Assam. *Library Philosophy and Practice*, 0_1.


Kehinde, J. (2012). Citation Analysis of Dissertations and Theses Submitted to the Department of Agricultural Economics and Extension, Federal University of Technology Akure, Nigeria. *Library Philosophy and Practice (e-journal)*, 741.

Knievel, J. (2013). Alignment of Citation Behaviors of Philosophy Graduate Students and Faculty. Evidence Based *Library and Information Practice*, 8(3), 19-33.


Olatokun, W. M. (2009). Citation analysis of doctoral works submitted to the Department of Animal Science, University of Ibadan, Nigeria.

Punchihewa, C.N.D. (2014). Citation analysis of master theses as a collection development tool: A Case study at University of Moratuwa, Sri Lanka Conference: Proceedings of the NILIS Research Symposium, At Colombo


