Chapter–V

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION
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5.0 Introduction
Citation analysis, in a way is useful for the professional librarians to revise and rectify their subscription policies when the budgetary provision is limited. The possibility of subscribing to the core journals covering maximum segment of contemporary literature is possible through the citation analysis. Moving further, it helps in providing appropriate services to the research scientists by keeping them aware of the recent trends and developments in their particular disciplines. The citation analysis acts as a bridge between the cited documents and citing documents.

The Doctoral theses which are submitted to the fourteen departments of GKVK for the award of doctorate degrees during the period of 2001-2011 is examined through the citation analysis with the objective of finding the usefulness and effectiveness of the library collections belonging to the departments.

5.1 Summary of Findings
The following are the major finding drawn from the study.
1. The study recognized the lack of uniformity and consistency in rendering bibliographic citations in the theses, mainly as to the format of citations. Further, it is also pointed out that there is no uniformity even within the citations of the same thesis.
2. It is clear from the table 4.1 that the highest number of theses is from Horticulture department having 65 theses representing 14.97%, Genetics and Plant Breeding is in the second place having 44 theses representing 10.13%, Agronomy is in the third place having 39 theses representing 8.98%, the fourth place Soil Science and Agriculture Chemistry representing with 36 theses representing 8.29%, Agriculture Entomology and Crop Physiology both are in the fifth place with 35 theses each representing 8.04%.
3. It is found that the average citations per thesis of various departments of GKVK are as follows the department of Agricultural Microbiology is having
124.48, department of Soil Science and Agriculture Chemistry with 126.08, department of Agricultural Entomology accounting 122.28, department of Plant Pathology depicting 119.30, department of Agricultural Economics representing 141.95, department of Agricultural Extension with 123.29, department of Horticulture accounting 120.2, department of Agronomy with 125.94, department of Genetics and Plant Breeding having 124.63, department of Crop Physiology accounting 120.97, department of Sericulture with 134, department of Seed Science and Technology depicting 180.8, department of Foods and Nutrition presenting 182.46 and department of Plant Biotechnology with 192.8.

4. The journals are the highly cited source with 29377 citations representing 52.12% among all the bibliographical forms of resources followed by books with percentage of 16.59, next is theses and dissertations with the percentage of 8.66 and the rest followed by reports, web sites, conference proceedings, seminars proceedings, workshops proceedings, patents and others with 6.71%, 0.8%, 4.13%, 3.55%, 3.3%, 0.57% and 3.57% respectively.

5. While considering journals and books together, there are 38730 citations representing 68.71%. Among all the sources of information, citations from journals and books constitute a major segment and the rest of the sources are cited to a very limited extent.

6. The use of grey literature can be seen to a considerable extent. The study depicted that there are 17194 citations representing grey information sources which account for 30.51%.

7. Print sources are highly cited when compared to the web resources. Mere 436 citations representing 0.77% pertains to the web resources.

8. The researchers have referred and cited at large, the recently published sources that are from the year 2001-2011 having 27353 citations representing 48.54%. where as 29007 citations are from 1910 and later up to 2000 this indicates that the use of current sources of information is more.

9. In table 4.10 it is clear that the researchers tend to study the agricultural pattern in India as most of the citations references are taken from Indian resources and the number of citations is 18615 representing 33.1%, allowing
USA to come next with the citations of 12451 with the percentage of 22.09, the UK with 9777 citations representing 17.34% is in the third place, followed by of Netherlands, Japan, Australia, Germany, China, Canada and others.

10. The researchers have cited information sources of Indian journals at large, followed by USA, UK and Netherlands 10896, 5723, 3975 and 1084 citations respectively.

11. The researchers have highly cited journal articles which are in English language. Altogether, 29303 citations representing 99.71% pertains to English language publications.

12. Very few regional language citations are also identified in the theses. However, the number is very negligible, with 74 citations representing just 0.27%.

13. It is obvious from the table 4.15 that in all the fourteen departments single author citations from research documents are less in number compared to the multiple authorship citations. Collaborative authorship papers represent 69.04% with 38090 citations whereas single authorship papers represent 30.8% with 17358 citations.

14. The table 4.16 depicts the degree of collaboration in GKVK departments. is 0.691 which the study conveys that the team research is prominent in this filed. It is clear that multiple or collaborative authorship patterns are more in journals articles ranking first with 40.82 %, next is the books with 11.76%, followed by other forms of bibliographical forms.

15. The table- 4.18 displays that from the year 1910 and before up to 1960 single author articles are actually more in number. During 1961 to 2011 collaborative author works are more. It is clear that 30.85% are single authorship pattern further moving to two, three, four, five and above authorship with 69.15%. From 1960 and henceforth collaborative authorship is very high in agriculture science research.

16. Among the top ten ranked authors, eight are Indian authors. The author, Kaya H.K. has the highest number of citations, with 127 citations placing first, Gupta A.K. is having second highest number of citations with 113 citations,
Daramola J. A is the third highest, with 103 citations. Nandu M.R with 92 citations is the fourth and the fifth top author is Poinar G.O with 85 citations.

17. As per the arithmetic counting of Van Hooydonk, (1997) the ranking of authors are Walia U.S. and Mote U.N. both have the highest number of citations, with 40 citations placing first, Yadav D. is having second highest number of citations with 39 citations, Edison S. A., Kaya H.K. and James George have the third highest, with 38 citations each. Chauhan J.S. and Maxwell D. G. with 37 citations are the fourth and the fifth top authors are Das N.R., Kukal S.S. and Shetty H.S with 86 citations.

18. The researchers have extensively cited the journals published by Elsevier to the extent of 1269 citations, followed by Blackwell Publishing with 843 citations, next by Springer with 754 citations, and Indian Council of Agricultural Research with 747 citations.

19. Another highlighting aspect is that among the 14 departments of GKVK the citations pertaining to the journal literature of the 10 the departments confirm with the Bradford’s Law of scattering.

20. As regards to subscription to the ranked journals, out of 117 ranked Indian journals, 92 are being subscribed to the library and 25 journals have not been subscribed. Among these 92 Indian journals, 2 are in hard copy form and 90 are online version. As regards foreign journals, out of 258 ranked journals, 2 are in hard copy form and 70 are online version and 186 foreign journals have not been subscribed. Thus, among the top ranked journals, 164 are available/accessible to the researchers of GKVK.

21. The top 100 ranking of journals of all the departments can be viewed from the table 4.65. The Indian Journals of Agricultural Research stands first among all the departments journals with the total citations of 764 from 29377 journal citations and this journal is published in India. The second most referred journal is Madras Agricultural Journal from India having 383 citations and the third place is shared by Indian Journal of Genetics and Plant Breeding and Indian Journal of Horticulture which are published in India with the citations of 278. The fourth most referred journal is Journal of American Oil Chemistry...
Society from USA with 274 citations, the fifth rank is obtained by Indian Journal of Extension Education again from India with the citations of 248.

22. In the table 4.66 the scoring of the top ten journals ranked among hundred journals are given as per the National Academy of Agricultural Sciences (NAAS). It is clear that out of ten journals the two USA journals have the highest scores with 8.60 for the American Journal of Botany and 7.54 for the Journal of American Oil Chemists Society next followed by Indian Journal of Experimental Biology from India with the score 6.84 and Indian Journal of Genetics and Plant Breeding with the score of 6.19 and The Madras Agricultural Journal with 3.98 score.

23. The aging and diachronous obsolescence analysis and half-life of journals pertaining to all the fourteen departments of GKVK is 11 years.

24. The table 4.68 shows 0 to 100 years and above the distribution of citation age. The oldest reference and cited journal is 309 years old. The researchers of all the fourteen departments have cited 50% journals age within 11 years. This shows that the researchers rely more upon current journals.

5.2 Tenability of Hypotheses

The following hypotheses have been tested with the findings of the study.

Hypothesis-1: The researchers use grey literature to a considerable extent.

Grey literatures are research products and resources produced by organizations that separate from the academic publishing and traditional commercial and distribution channels. In GKVK the researchers have used the grey literature to the extent of 30.51% in comparison with other Bibliographical forms accounting 69.49%. This shows that even grey literature are supporting the research activity in this university. Therefore, the Hypothesis 1 is accepted.

Hypothesis-2: The journals receives more citations than the other sources of information.

In all these departments the maximum used source type is journal articles representing 52.12%, next followed by books representing 16.59%, theses and dissertations are after that with 8.66%, the rest followed by reports, web resources,
conference proceedings, seminars proceedings, workshops proceedings and others with 6.70%, 0.77%, 4.13%, 3.55%, 3.30% and 4.14% respectively. It clearly proves that journal articles are the maximum source material used for the research work in Agriculture University **Hence the Hypothesis 2 is accepted.**

**Hypothesis-3:** The researchers depend more on the current literature.

The researchers of all departments are highly dependent on current literature. The table 4.8 shows that the citations during 2001-2011 shows 48.53% and 1991-2000 depicts 23.34%. Hence it is clear that the researchers of all the departments are depending more on recent literature for their research work. **Hence the Hypothesis 3 is accepted.**

**Hypothesis-4:** The multiple authorship sources recevies more citations than the sources of single authorship.

It is obvious from the table 4.15 that single author citations from research documents are less in number compared to the multiple authorship citations. Collaborative authorship papers represent 69.04% whereas single authorship papers represent 30.8%. **Hence the Hypothesis 4 is accepted.**

**Hypothesis – 5** The Indian journals receives more citations when compared to journals of other countires.

The table 4.65 clearly reveals that among the top hundred ranked journals, the maximum cited are Indian Journals having 9758 citations out of 29377 of total citations from journals. Indian Journal of Agricultural Research from India is having 764 citations, the highest of all, followed by The Madras Agricultural Journal from India having 383 citations, third is Indian Journal of Genetics and Plant Breeding and Indian Journal of Horticulture both with 278 citations and the Journal of American Oil Chemists’ Society from USA is having 274 citations and the top fifth is journal is Indian Journal of Extension Education again from India with 248 citations. From this it is clear that the researchers have cited Indian journals more when compared with journals of other countries. **Hence the Hypothesis 5 is accepted.**
5.3 Suggestions

In the light of the findings of the study the following suggestions are made.

1. The other forms of documents such as annual reports, technical reports, and manuscripts are less used and this may be due of lack of knowledge of these documents. This problem can be overcome by extending the cataloguing, indexing and abstracting services and conduct of orientation programmes.

2. Although there is adequate subscription of online resources to GKVK library, the use of online resources is very low as per citations rendered in the theses. Therefore, the library has to bring awareness about online sources among researches and the proper orientation should be given for utilization of available online resources by conducting of user education programmes. The library orientation programmes on electronic resources should be conducted at regular intervals to keep phase with the advancement of technologies.

3. Considering the growing demand of the researchers on the GKVK library, the library committee should examine and revise the acquisition policy so that the sources that are in demand may be procured on priority.

4. As there are many Agriculture Universities all over India, a consortium may be constituted for resource sharing of print and electronic resources and thereby increases the useful information sources and reduce the cost of subscription.

5. As the citations from Indian journals are found to be more, all the Indian journals related to the fourteen departments have to be subscribed.

6. While rendering references and bibliography, the researchers have to follow a systematic method. Here, uniformity and consistency in rendering bibliographic items as well as, punctuation marks have to be followed. Therefore, by the conduct of orientation or training programmes the researchers have to be trained to render citations in a systematic way.

7. It is also suggested to adopt the standard Reference Managers such as, EndNote, Mendeley, Zotero for maintaining uniformity and consistency in rendering citations in doctoral theses and research papers.

8. As there is usage of grey literature to a considerably extent of, the acquisition and organisation of these grey sources be done systematically in the GKVK library.
5.4 Further Scope for Research

The present study is based on the citations rendered in the doctoral theses of all the fourteen departments of GKVK for the period 2001 to 2011. Similar type of study may be carried out covering the theses submitted before 2001 and after 2011. A comparative study of citation patterns among the departments of GKVK University can also be done. This type of study gives an in-depth knowledge and type of the literature used by the researchers of agricultural sciences. Study can be done on the citation analysis of doctoral theses submitted to various agricultural universities in the country so that what sources are being extensively used by the researchers especially, the journals and online information sources can be understood.

5.5 Conclusion

The ‘Citation Analysis’ is one of the means adopted by the libraries to understand the extent of the use of various forms of information sources. Obtaining direct feedback from the users of the libraries or the researchers who have made use of the library resources is also being followed extensively by the libraries and the library committees to decide on the acquisition policy, more specifically pertaining to renewal of subscriptions to journals. However, citation studies is really an authoritative method to analyze and understand the pattern of use of journals, books, reports, theses, proceedings of seminars and conferences, archival materials and various reference sources. The study also reveals or depicts important journals, publishers, publications of various research institutions and societies, including popular scientists and authors in the concerned discipline. Another important aspect is that the obsolescence pattern can also be determined by the citation studies.

A number of research institutions rely upon citation studies to know the journals which are in high demand. The ranking of journals based on the use, really helps the libraries to take valid decisions as to whether the subscription can be continued or discontinued depending on the extent of use by the user communities. The citation studies in a way helps the librarians to evaluate the quality of the library holdings as well. And also serves as a means to identify the strength and weakness of the library collection and thereby, revise the collection development policies. The
feed-back of the library users obtained through the questionnaires at times may not be reliable. However, the evaluation based on the citation studies is an authoritative one as it really depicts the sources consulted and referred by the authors, researchers, scientists and academicians of the concerned disciplines as well as, institutions. Further, the publishers can revise their publishing policies based on the extent of use of their publications depicted by the citation studies.

Thus, the citation studies form an authoritative method to know the use pattern and, quality of the content of various sources of information based on the extent of use. The librarians and administrators can rely upon the citation studies as a means for acquisition of information sources where the budget provision is limited and inadequate. Thus, the present study gives an idea to the GKVK librarian and his staff including the research scientists in making an appropriate acquisition policy.